

**ENVIRONMENTAL ASSESSMENT
OF THE
INSTALLATION PEST MANAGEMENT PLAN
FOR
U.S. ARMY AVIATION AND MISSILE COMMAND,
REDSTONE ARSENAL, ALABAMA**



**U.S. ARMY AVIATION AND MISSILE COMMAND
REDSTONE ARSENAL, ALABAMA**

SEPTEMBER 21, 1999

21 September 1999

**FINDING OF NO SIGNIFICANT IMPACT (FNSI)
FOR THE ENVIRONMENTAL ASSESSMENT OF THE
INSTALLATION PEST MANAGEMENT PLAN
FOR
U.S. ARMY AVIATION AND MISSILE COMMAND,
REDSTONE ARSENAL, ALABAMA**

BACKGROUND: Redstone Arsenal (RSA) is located in Madison County, Alabama, southwest of and adjacent to the City of Huntsville, Alabama. Prior to acquisition by the Army, the land comprising the current RSA was used for producing cotton, corn, hay, small grain crops, and livestock. The original land was purchased in 1941-1942 from 320 landowners under the Siebert Arsenal Project. Under this project, the Huntsville Arsenal and Redstone Arsenal were constructed to manufacture chemical munitions. The two Arsenals were eventually combined into the current RSA in 1949 with an approximate 32,000 acres. Over the ensuing years, acreage has been increased and reduced during various transactions. Redstone Arsenal is currently comprised of 37,910 acres (including special-use permit land) located on a site approximately six miles wide by ten miles long.

DESCRIPTION OF THE PROPOSED ACTION: The Proposed Action is to implement the recently updated (October 1998) Installation Pest Management Plan (IPMP) in a timely, consistent, and effective manner. Redstone Arsenal, in its entirety, is covered by the IPMP. The IPMP for RSA describes the Installation's pest management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety and environmental requirements of the plan. The plan would serve as a guide for maintaining a safe and healthy environment to control plant and animal pests that could interfere with the military mission, damage real property, increase maintenance costs, and expose Installation personnel to disease.

ALTERNATIVES CONSIDERED: The only other alternative considered, outside of the Proposed Action, was the No-Action Alternative. Under this alternative, the Army would not implement the IPMP. Without implementation of the IPMP, there would be no concise, comprehensive operating procedures in place to manage the Arsenal's pest management activities.

ENVIRONMENTAL EFFECTS: Eleven broad environmental components were considered to provide a context for understanding the potential effects of the Proposed Action and to provide a basis for assessing the significance of potential impacts. The areas of environmental consideration are air quality, biological resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources.

Cumulative impacts of the Proposed Action, with respect to each of these environmental components, were also analyzed.

The Proposed Action would have potentially positive impacts to biological resources, health and safety, infrastructure and transportation, land use, geology and soils, and water resources. Positive cumulative impacts would be expected in the areas of biological resources, infrastructure and transportation, land use, and water resources. There would be no anticipated significant impacts to the other environmental resources considered. Any determined impacts to the environment would be mitigable.

If the No-Action Alternative is selected, the IPMP would not be implemented. There would be no comprehensive pest management for RSA. The Arsenal would experience decreased grounds maintenance, increased fire hazard, inconsistent pesticide management, a possible loss of suitable floral and faunal habitats (including threatened and endangered species habitats), and decreased availability of outdoor recreation activities. Under the No-Action Alternative, potential adverse impacts would be expected to biological resources, health and safety, infrastructure and transportation, land use, geology and soils, and water resources.

CONCLUSION: The Directorate of Environmental Management and Planning has prepared an environmental assessment that addresses the Proposed Action and evaluates the potential environmental impacts of the Proposed Action. Based on the Environmental Assessment of the Installation Pest Management Plan for U.S. Army Aviation and Missile Command, Redstone Arsenal, Alabama, 4 June 1999, we conclude that there would be no significant environmental impacts associated with this action which would require the publication of an Environmental Impact Statement. Should you wish to review this Environmental Assessment or comment on this action, you may contact Ms. Pam Rogers, 256-876-4162, Commander, U.S. Army Aviation and Missile Command, Attn: AMSAM-IN (Ms. Pam Rogers), Redstone Arsenal, Alabama, 35898-5020, within thirty days from the date of publication.

DEPARTMENT OF THE ARMY
UNITED STATES ARMY AVIATION AND MISSILE COMMAND
REDSTONE ARSENAL, ALABAMA

FINDING OF NO SIGNIFICANT IMPACT
FOR THE ENVIRONMENTAL ASSESSMENT OF THE
INSTALLATION PEST MANAGEMENT PLAN

PREPARED 21 SEPTEMBER 1999

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EXECUTIVE SUMMARY

INTRODUCTION

Redstone Arsenal (RSA) is located in Madison County, Alabama, southwest of and adjacent to the City of Huntsville, Alabama. Prior to acquisition by the Army, the land comprising the current RSA was used for producing cotton, corn, hay, small grain crops, and livestock. The original land was purchased in 1941-1942 from 320 landowners under the Siebert Arsenal Project. Under this project, the Huntsville Arsenal and Redstone Arsenal were constructed to manufacture chemical munitions. The two Arsenals were eventually combined into the current RSA in 1949 with an approximate 32,000 combined acres. Over the ensuing years, acreage has been increased and reduced during various transactions. RSA currently comprises 37,910 acres (including special-use permit land) located on a site approximately six miles wide by ten miles long.

DESCRIPTION OF PROPOSED ACTION

The Proposed Action is to implement the recently updated (October 1998) Installation Pest Management Plan (IPMP) in a timely, consistent, and effective manner. Redstone Arsenal, in its entirety, is covered by the IPMP. The IPMP for RSA describes the Installation's pest management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety and environmental requirements of the plan. The plan would serve as a guide for maintaining a safe and healthy environment to control plant and animal pests that could interfere with the military mission, damage real property, increase maintenance costs, and expose Installation personnel to disease.

METHODOLOGY

The purpose of this Environmental Assessment (EA) is to analyze the potential environmental consequences of the Proposed Action in compliance with the National Environmental Policy Act (NEPA); Department of Defense Directive 6050.1, *Environmental Effects in the United States of Department of Defense Actions*; and Army Regulation (AR) 200-2, *Environmental Effects of Army Actions*.

Eleven broad environmental components were considered to provide a context for understanding the potential effects of the Proposed Action and to provide a basis for assessing the significance of potential impacts. The areas of environmental consideration are: air quality, biological resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources.

To assess the significance of environmental impacts, a list of activities necessary to accomplish the Proposed Action was developed. The environmental setting was then described. Next, those activities with the potential for significant environmental consequences were identified. The significance criteria used to evaluate the environmental effects of program activities include three levels of impacts: no impact, no significant impact, and significant impact.

RESULTS

This section summarizes the conclusions of the analyses made for each of the 11 areas of environmental consideration based on the application of the described methodology.

AIR QUALITY - There would be no significant impacts to air quality expected from implementing the IPMP. Federal and state ambient air quality standards concentration criteria would not be exceeded due to IPMP implementation. While the periodic application of pesticides on the Arsenal will emit volatile vapors, only small areas would be treated at any one time. The area of application and the varied treatment scheduled would create no significant impact to air quality. The application of pesticides on RSA would be in compliance with federal, state, local, Department of Defense (DoD), and Army regulations.

BIOLOGICAL RESOURCES - There would be positive cumulative impacts to biological resources and biodiversity expected from implementing the IPMP.

Vegetative Communities - Implementing the IPMP would improve sustainability of healthy, diverse, and productive plant resources on the Installation and result in overall positive benefits.

Fish and Wildlife Communities - Implementing the IPMP would improve the sustainability of healthy, diverse, and productive animal communities, reflective of a naturally balanced ecosystem.

Wetlands - Implementing the IPMP would indirectly improve the sustainability of plant and animal species diversity and numbers on the Arsenal's approximately 9,889 acres of wetlands. As biologically productive natural ecosystems, RSA's wetland resources are critical to sustaining biodiversity in the local area.

Aquatic Resources - Aquatic habitats and the broad range of species found in the 10,000 acres of the Arsenal affected by the Tennessee River and other tributary systems would be managed and improved to further support habitat and species biodiversity in the region of influence (ROI) and beyond.

Threatened and Endangered Species - Implementing the IPMP would indirectly benefit threatened and endangered flora and fauna, indigenous to RSA, and their habitats.

CULTURAL RESOURCES - There would be no significant impacts expected to cultural resources from implementing the IPMP. During IPMP activities, any items observed that might have historical or archaeological value would be reported immediately to Arsenal Cultural Resource personnel so that the Cultural Resource Manager may determine their significance and any special disposition of the finds. Activities in the area of the discovery that may result in destruction of these resources would cease and personnel would be prevented from trespassing on, removing, or damaging such resources.

HAZARDOUS MATERIALS AND WASTE - Hazardous materials, primarily herbicides and pesticides, would be used under the IPMP. There are no significant impacts expected, since proper pesticide application and good management practices would be used and monitored. If necessary, pesticides or pesticide containers would be disposed of as hazardous waste in accordance with federal, state, local, DoD, and Army regulations.

HEALTH AND SAFETY - There would be positive impacts expected to health and safety from implementing the IPMP. Many of the pests targeted for control are carriers of serious disease organisms; therefore, their control would be highly beneficial.

Personal Protective Equipment (PPE) would be used for pesticide application. Government employees or contractors who are DoD or state certified would apply pesticides. No aerial application of pesticides would occur under the proposed plan unless a serious disease or infestation required emergency treatment and prior approval was obtained by the U.S. Army Aviation and Missile Command.

INFRASTRUCTURE AND TRANSPORTATION - There would be positive cumulative impacts expected to infrastructure and transportation from implementing the IPMP. By controlling vegetation growth, utility access would be maintained.

Utility outages caused by restrictive overgrowth would be minimized. Proper maintenance of utility rights-of-way would protect the RSA infrastructure, provide access for emergency crews, and minimize loss and service disruptions as a result of incidents such as fire and natural disasters.

LAND USE - There would be positive impacts expected to land use from implementing the IPMP. Use of the IPMP would result in effective, economical and environmentally acceptable pest control and would be instrumental in maintaining compliance with pertinent laws and regulations.

The fourteen major land use areas (family housing, troop housing, community facilities, recreation, administration, training facilities, operational facilities, operational maintenance facilities, production facilities, research and development facilities, test areas, storage, post maintenance and utilities, and the National Aeronautics and Space Administration (NASA) Marshall Space Flight Center) would be programmatically maintained in concert with Redstone Arsenal's natural resources.

NOISE - There would be no impacts to noise expected by implementing the IPMP. Normal noise producing activities on Redstone Arsenal would continue, but would not be affected by the IPMP. The only sources of noise associated with the IPMP would be from the use of mechanized equipment during pesticide application to wide-open areas. While wildlife may temporarily move away from these noise-producing activities, they will return when the activities have ended.

GEOLOGY AND SOILS - Positive impacts to geology and soils would be expected. Potentially significant adverse impacts (e.g., severe soil erosion from improper pesticide application) could occur in the absence of the IPMP. Additionally, without appropriate guidance, excess chemicals could be applied directly to the ground surface through spills or over-application.

SOCIOECONOMICS - There would be no significant impacts expected to socioeconomics from the implementation of the IPMP. No additional personnel are anticipated to be required for the implementation of the plan and there would be no anticipated impacts to population or employment in the region.

WATER RESOURCES - There would be a positive impact to water resources expected from implementing the IPMP. Guidelines would be provided to DoD personnel and contractors prior

to activities that could potentially impact water resources. This action would avoid unnecessary contamination, protect valuable natural resources, and preclude restoration cost.

The proper use and disposal of pesticides would be addressed to avoid the adverse affects of contaminated runoff and excess nutrients entering streams and aquifers, helping to ensure compliance with federal and state water quality standards.

CONCLUSION

The Proposed Action (Alternative 1) would most effectively manage and preserve Redstone Arsenal's pest management activities as required by federal, state, local, DoD, and Army regulations. If the Proposed Action is selected, Redstone Arsenal would implement the IPMP in a timely, consistent, and effective manner. The IPMP describes the Installation's pest management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety, and environmental requirements of the program. The plan would serve as a guide for maintaining a safe and healthy environment to control plant and animal pests that could interfere with the military mission, damage real property, increase maintenance costs, and expose Installation personnel to disease.

The Proposed Action would have potentially positive impacts to biological resources, health and safety, infrastructure and transportation, land use, geology and soils, and water resources. Positive cumulative impacts would be expected for the environment in the areas of biological resources, infrastructure and transportation, land use, and water resources. There would be no anticipated significant impacts to the other environmental resources considered. Any identified impacts to the environment are not considered to be significant and would be mitigable.

If the No-Action Alternative were selected, the IPMP would not be implemented. There would be no comprehensive pest management for RSA. The Arsenal would potentially experience inconsistent pesticide management resulting in a reduction in grounds maintenance, increased fire hazard, a possible loss of suitable and varied floral and faunal habitats including threatened and endangered species habitats, increased disease potential, and decreased availability of outdoor recreation activities. Under the No-Action Alternative, potential adverse impacts would be expected to biological resources, health and safety, infrastructure and transportation, land use, geology and soils, and water resources.

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	ES-1
TABLE OF CONTENTS.....	i
1.0 INTRODUCTION.....	1-1
1.1 Background.....	1-1
1.1.1 Description of the Proposed Action.....	1-3
1.1.2 Purpose of and Need for the Action	1-3
1.1.3 Location.....	1-4
1.2 Related Environmental Documentation.....	1-4
1.3 Agencies Involved in Environmental Analysis.....	1-5
1.4 Public Involvement.....	1-5
2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION.....	2-1
2.1 Summary of Alternatives	2-1
2.2 Description of Alternatives Including the Proposed Action	2-1
2.2.1 Alternative 1 - Proposed Action	2-1
2.2.2 Alternative 2 - No-Action Alternative.....	2-1
2.3 Comparison of Environmental Consequences	2-1
3.0 AFFECTED ENVIRONMENT	3-1
3.1 Air Quality.....	3-1
3.2 Biological Resources.....	3-2
3.3 Cultural Resources.....	3-6
3.4 Hazardous Materials and Waste.....	3-7
3.5 Health and Safety.....	3-8
3.6 Infrastructure and Transportation	3-9
3.7 Land Use.....	3-9
3.8 Noise	3-10
3.9 Geology and Soils.....	3-11
3.10 Socioeconomics	3-12
3.11 Water Resources	3-13
4.0 ENVIRONMENTAL CONSEQUENCES	4-1
4.1 Air Quality	4-2
4.1.1 Proposed Action	4-2
4.1.2 No-Action Alternative	4-2
4.1.3 Cumulative Impacts.....	4-2
4.1.4 Mitigation Measures	4-3
4.2 Biological Resources	4-3
4.2.1 Proposed Action	4-3
4.2.2 No-Action Alternative	4-5
4.2.3 Cumulative Impacts.....	4-6
4.2.4 Mitigation Measures	4-6
4.3 Cultural Resources.....	4-6
4.3.1 Proposed Action	4-6

4.3.2	No-Action Alternative	4-6
4.3.3	Cumulative Impacts	4-7
4.3.4	Mitigation Measures	4-7
4.4	Hazardous Materials and Waste.....	4-7
4.4.1	Proposed Action	4-7
4.4.2	No-Action Alternative	4-8
4.4.3	Cumulative Impacts	4-8
4.4.4	Mitigation Measures	4-8
4.5	Health and Safety	4-9
4.5.1	Proposed Action	4-9
4.5.2	No-Action Alternative	4-9
4.5.3	Cumulative Impacts	4-9
4.5.4	Mitigation Measures	4-9
4.6	Infrastructure and Transportation	4-10
4.6.1	Proposed Action	4-10
4.6.2	No-Action Alternative	4-10
4.6.3	Cumulative Impacts	4-10
4.6.4	Mitigation Measures	4-10
4.7	Land Use	4-10
4.7.1	Proposed Action	4-11
4.7.2	No-Action Alternative	4-11
4.7.3	Cumulative Impacts	4-11
4.7.4	Mitigation Measures	4-11
4.8	Noise	4-11
4.8.1	Proposed Action	4-11
4.8.2	No-Action Alternative	4-12
4.8.3	Cumulative Impacts	4-12
4.8.4	Mitigation Measures	4-12
4.9	Geology and Soils.....	4-12
4.9.1	Proposed Action	4-12
4.9.2	No-Action Alternative	4-13
4.9.3	Cumulative Impacts	4-13
4.9.4	Mitigation Measures	4-13
4.10	Socioeconomics	4-13
4.10.1	Proposed Action	4-13
4.10.2	No-Action Alternative	4-13
4.10.3	Cumulative Impacts	4-14
4.10.4	Mitigation Measures	4-14
4.11	Water Resources	4-14
4.11.1	Proposed Action	4-14
4.11.2	No-Action Alternative	4-14
4.11.3	Cumulative Impacts	4-14
4.11.4	Mitigation Measure.....	4-15
4.12	Cumulative Impacts	4-15
4.13	Mitigation Measures	4-15
4.14	Individuals/Agencies Responsible for Obtaining Required Permits/Licenses/Entitlements	4-16

4.15	Conflicts With Federal, State, or Local Land Use Plans, Policies, and Controls	4-16
4.16	Energy Requirements and Conservation Potential	4-16
4.17	Natural or Depletable Resource Requirements and Conservation Potential	4-17
4.18	Irreversible or Irretrievable Commitment of Resources	4-17
4.19	Biological Diversity	4-17
4.20	Adverse Environmental Effects That Cannot Be Avoided	4-16
4.21	Relationship Between Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity	4-17
4.22	Federal Actions to Address Environmental Justice In Minority Populations and Low-Income Populations	4-17
4.23	Conditions Normally Requiring an Environmental Impact Statement.....	4-18
5.0	CONCLUSIONS AND RECOMMENDATIONS	5-1
6.0	LIST OF PREPARERS	6-1
7.0	INDIVIDUALS/AGENCIES CONSULTED	7-1
7.1	Agencies/Organizations/Individuals Sent Copies of the Assessment.....	7-1
7.2	Individuals and Agencies Contributing to the Project	7-1
8.0	REFERENCES.....	8-1
9.0	ACRONYMS AND ABBREVIATIONS	9-1

LIST OF FIGURES

1-1	Redstone Arsenal Locator Map.....	1-2
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LIST OF TABLES

2-1	Comparison of Environmental Consequences Associated With Implementation of the October 1998 IPMP.....	2-2
3-1	National and Alabama Ambient Air Quality Standards.....	3-2
3-2	Federally Listed Endangered and Threatened, Alabama Protected, and Special Concern Species Occurring on Redstone Arsenal.....	3-6
3-3	Current Redstone Arsenal Land Use.....	3-10

CHAPTER 1.0

INTRODUCTION

The National Environmental Policy Act (NEPA); the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508); Department of Defense (DoD) Directive 6050.1, *Environmental Effects in the United States of Department of Defense Actions* (U.S. Department of Defense 1979); and AR 200-2, *Environmental Effects of Army Actions* (U.S. Department of the Army 1988), which implements these laws and regulations, direct DoD and Army officials to consider environmental consequences when authorizing or approving federal actions. Accordingly, this environmental assessment (EA) analyzes the environmental consequences of the Installation Pest Management Plan (IPMP) (October 1998) for the U.S. Army Aviation and Missile Command, Redstone Arsenal, Alabama.

Section 1.0 of this EA discusses the background and gives a brief description of the Proposed Action, introduces the purpose of and need for the action, notes the location of the project, and highlights issues raised during the assessment process. Section 2.0 discusses project alternatives including the Proposed Action and compares the environmental consequences of the alternatives. Section 3.0 describes the affected environment at the location of the Proposed Action. Section 4.0 assesses the potential environmental consequences of implementing the Proposed Action and alternatives; it also highlights cumulative impacts and mitigation measures for each resource. Section 5.0 highlights the conclusions of the assessment. Section 6.0 contains a list of preparers for this EA. Section 7.0 lists the individuals and agencies consulted during the preparation of this EA and the agencies, organizations, and individuals that were provided a copy of the EA. Section 8.0 contains a list of the references used to prepare this document.

1.1 Background

RSA is located in Madison County in north-central Alabama (Figure 1-1), southwest of and adjacent to the City of Huntsville, Alabama. The Installation is located in the Tennessee Valley in the southwestern portion of Madison County. It is bounded by the Tennessee River on the south, the City of Huntsville to the north and east, the City of Madison to the west, and Wheeler National Wildlife Refuge (WNWR) to the southwest. Prior to acquisition by the Army, the land comprising the current RSA was used for producing cotton, corn, hay, small grain crops, and livestock. The original land was purchased in 1941-1942 from 320 landowners under the Siebert Arsenal Project. Under this project, the Huntsville Arsenal and Redstone Arsenal were constructed to manufacture chemical munitions. The two arsenals were eventually combined into the current RSA in 1949 with an approximate 32,000 combined acres. Over the ensuing years, acreage has been increased and reduced during various transactions. Redstone Arsenal is currently comprised of 37,910 acres (including special-use permit land). RSA is roughly rectangular, approximately 60 square miles in area (ten miles long by six miles wide), and employs approximately 29,000 government and contractor personnel.

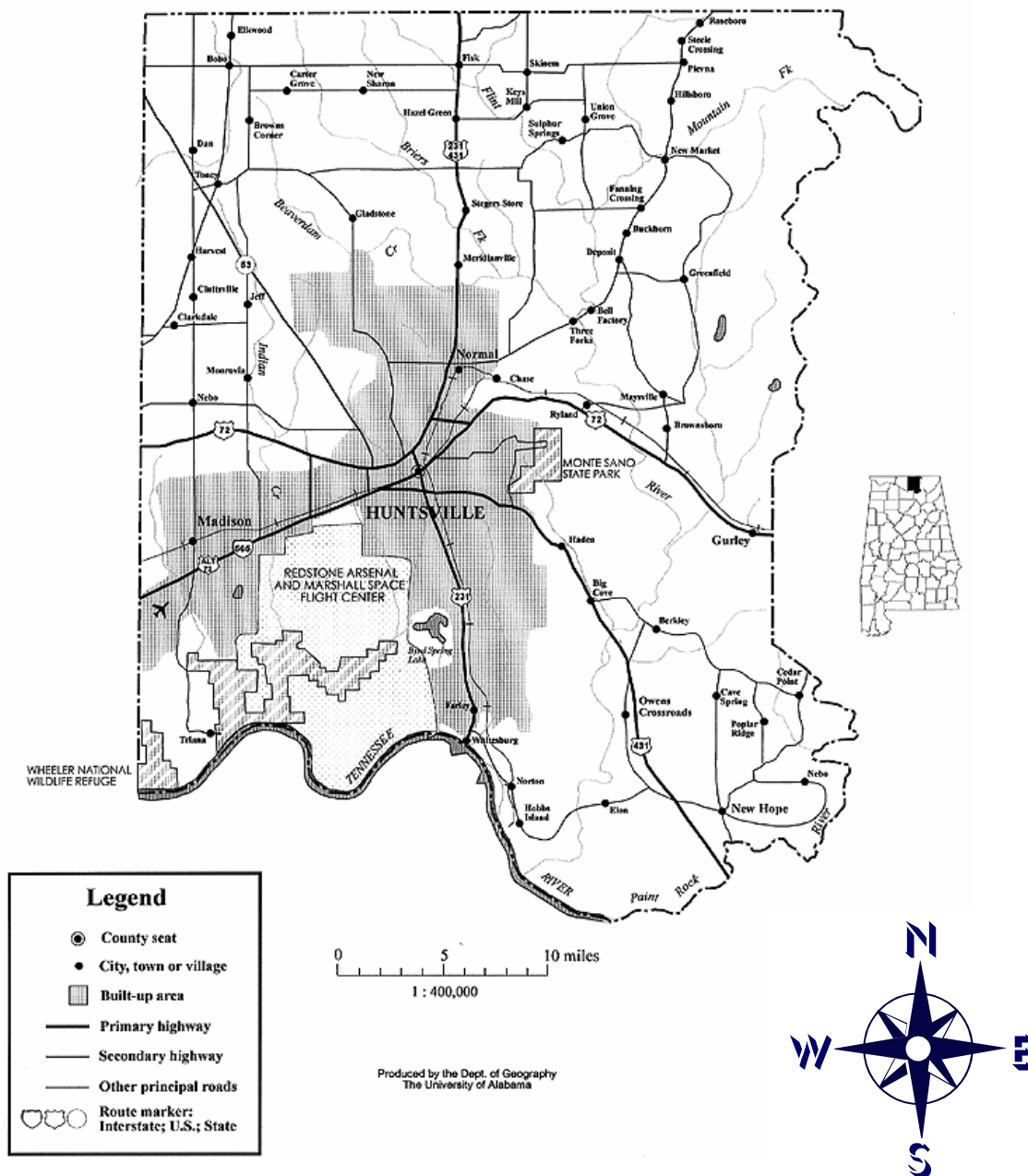


Figure 1-1 Redstone Arsenal Locator Map

1.1.1 Description of the Proposed Action

The Proposed Action is to implement the recently updated IPMP (October 1998) in a timely, consistent, and effective manner. The original time frame for the IPMP is fiscal year (FY) 1996 through FY 2000. Redstone Arsenal, in its entirety, is covered by the IRMP. The IPMP consists of twelve sections (A through L). Section A provides an introduction and general overview of the Plan. Section B lists the priority of pest control work. Section C contains Pest Control Workload Definition Worksheets. Section D of the IPMP describes administration policies and initiatives. Section E discusses health and safety issues relating to the IPMP. Section F discusses the necessary coordination between federal, state, and local agencies. Section G lists and describes environmental considerations. Section H discusses the Self-Help Program available on the Installation. Section I lists pest control services provided to tenant activities at the Installation. Section J discusses fire protection issues. Section K addresses quarantine requirements. Section L lists pest management references. The five appendices of the IPMP contain the Pest Control Workload Definition Worksheets, points of contact, pesticide inventory, pesticide application equipment inventory, and pest control certifications, respectively.

1.1.2 Purpose of and Need for the Action

The purpose of the IPMP is to provide guidance for operating and maintaining an effective pest management program. Pests included in the plan are weeds and other unwanted vegetation, termites, mosquitoes, crawling insects (ants, crickets, cockroaches, spiders, etc.) and mice, snakes, and other miscellaneous vertebrate pests. Principles of integrated pest management are stressed in the plan.

Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment. IPM is not a single pest control method but, rather, a series of pest management evaluations, decisions, and controls. Based on undated information from the U.S. EPA, Office of Pesticide Programs, IPM usually follows a four-tiered approach:

- **Set Action Thresholds:** Before taking any pest control actions, IPM first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken. Sighting a single pest does not always mean control is needed. The level at which pests will either become an economic or health threat is critical to guide pest control decisions.
- **Monitor and Identify Pests:** Not all insects, weeds, and other living organisms require control. Many organisms are innocuous, and some are beneficial. IPM programs work to monitor for pests and identify them accurately, so that appropriate control decisions can be made in conjunction with action thresholds. This monitoring and identification removes the possibility that pesticides will be used when they are not really needed or that the wrong kind of pesticide will be used.
- **Prevention:** As a first line of control, IPM programs work to manage the crop, lawn, or indoor space to prevent pests from becoming a threat. Control methods, such as good housekeeping in food storage and serving areas, or selection of pest resistant varieties for landscaping or crops,

can be very effective and cost-efficient and present little or no risk to people or the environment.

- **Control:** Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, IPM programs then evaluate the proper control method both for effectiveness and risk. Effective, less *risky* pest controls are chosen first, including highly targeted chemicals, such as pheromones to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identifications, and action thresholds indicate that less risky controls are not working, then additional pest control methods would be employed, such as targeted spraying of pesticides. Broadcast spraying of non-specific pesticides is a last resort.

The IPMP involves the judicious use of both chemical and non-chemical control techniques to achieve effective pest control with minimal environmental impacts. Without control, these pests could interfere with the military mission, damage real property, increase maintenance costs, and expose Installation personnel to diseases. The plan is needed as a guide for the safe and environmentally responsible storage and application of pesticides consistent with the military mission and federal and state policies on pest management practices as prescribed by the Federal Insecticide, Fungicide, and Rodenticide Act (through PL 100-460, 100-464 to 100-526, and 100-532); Title 40, Code of Federal Regulations, Section 165.10, *Recommended Procedures and Criteria for Storage of Pesticides and Pesticide Containers*; AR 40-5, *Preventive Medicine*, 15 October 1990; AR 40-574, *Aerial Dispersal of Pesticides*, 26 April 1976; AR 420-76, *Pest Management*, 3 June 1986; and DA PAM 420-7, *Pesticide Use Training*.

Pest management methods would be chosen on the basis of effectiveness, costs, and degree of ecological disruption, including minimum hazard to non-target organisms. The objective is to use chemical pesticides only where physical, cultural, and biological alternatives are impractical or incapable of providing adequate damage control. Chemical methods would supplement, rather than substitute for, other methods of damage control. When a chemical is needed, the most specific pesticide available for the target organism(s) would be chosen, unless persistence or other hazards preclude that choice.

1.1.3 Location

Redstone Arsenal, in its entirety, is the ROI covered by the IPMP. This area includes improved, semi-improved, and unimproved grounds, which total approximately 37,910 acres.

1.2 Related Environmental Documentation

A list of related environmental documentation reviewed during the preparation of this EA is shown below.

- *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation*, U.S. Army Missile Command, Redstone Arsenal, Alabama, December 1994.
- *Natural Resources Management Plan for Redstone Arsenal, Parts I, II, III, IV, V, VI*, July 1995.

1.3 Agencies Involved in Environmental Analysis

Agencies and individuals consulted during the preparation of this EA are listed in Section 7.0.

1.4 Public Involvement

Public involvement would take place at the completion of this EA process. There would be a 30-day comment period, after the Notice of Availability of the EA, before the Installation Pest Management Plan for U.S. Army Aviation and Missile Command, Redstone Arsenal, Alabama, is published in the local newspaper.

CHAPTER 2.0

ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 Summary of Alternatives

During the planning stages for the IPMP, the No-Action alternative was the only alternative considered to implementing the IPMP. Implementing the IPMP and the No-Action Alternative were assessed for potential impacts to the environment and described in the following sections.

2.2 Description of Alternatives Including the Proposed Action

2.2.1 Alternative 1 - Proposed Action

The Proposed Action is to implement the recently updated IPMP (October 1998) in a timely, consistent, and effective manner. The IPMP for RSA describes the Installation's pest management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety, and environmental requirements of the program. The plan is utilized as a guide for the safe and environmentally responsible storage and application of pesticides consistent with the military mission and federal, state, and local policies on pest management practices.

2.2.2 Alternative 2 - No-Action Alternative

If the No-Action alternative were selected, the IPMP would not be implemented. There would be no comprehensive plan to provide guidance for operating and maintaining an effective pest management program at Redstone Arsenal. Without a plan for control, pests have the potential to interfere with the military mission, damage real property, and increase maintenance costs. In addition, a lack of such a guide would result in the Arsenal experiencing an increase in the number of pests, including an increased danger from disease carrying pests. If a comprehensive guide is not implemented, environmental and safety and health issues may result due to the improper storage and application of pesticides or other harmful chemicals used to combat pests on the Arsenal.

2.3 Comparison of Environmental Consequences

The following sections discuss the environmental consequences of the alternatives considered within this EA. Table 2-1 provides a comparison of the potential environmental consequences associated with the implementation of the alternatives by individual resource. The information presented in this table is based on the environmental impact analysis presented in Section 4.0 of this EA. As outlined in Section 4.0, three levels of impact are defined.

- No Impact - No impact is predicted.
- No Significant Impact - An impact is predicted, but the impact does not meet the intensity/context significance criteria for the specific resource.
- Significant Impact - An impact is predicted that meets the intensity/context significance criteria for the specific resource.

**Table 2-1: Comparison of Environmental Consequences Associated
With Implementation of the October 1998 IPMP**

RESOURCE	PROPOSED ACTION	NO-ACTION ALTERNATIVE	CUMULATIVE IMPACTS	MITIGATION MEASURES
<i>AIR QUALITY</i>	X	---	NONE	YES
<i>BIOLOGICAL RESOURCES</i>	X	S	POSITIVE	YES
<i>CULTURAL RESOURCES</i>	---	---	NONE	N/A
<i>HAZARDOUS MATERIALS AND WASTE</i>	X	S	NONE	YES
<i>HEALTH AND SAFETY</i>	P	S	NONE	YES
<i>INFRASTRUCTURE AND TRANSPORTATION</i>	P	S	POSITIVE	YES
<i>LAND USE</i>	P	S	POSITIVE	YES
<i>NOISE</i>	---	---	NONE	NO
<i>GEOLOGY AND SOILS</i>	P	S	NONE	YES
<i>SOCIOECONOMICS</i>	X	---	NONE	NO
<i>WATER RESOURCES</i>	P	S	POSITIVE	YES

--- No Impact

X No Significant Impact

S Significant Adverse Impact

P Positive Impact

CHAPTER 3.0

AFFECTED ENVIRONMENT

This section describes the environmental resources that may be affected by the Proposed Action. The affected environment is described in order to provide a context for understanding the potential impacts. Those components of the affected environment that are of greater concern relevant to the potential impacts are described in greater detail.

Available literature (such as EAs and Installation master plans) was acquired, and data gaps (questions that could not be answered from the literature) were identified. To fill the data gaps and to verify and update available information, Installation personnel and federal, state, and local regulatory agencies were contacted. Cited literature, telephone interviews, and referenced material are presented in Section 8.0.

Eleven broad environmental components were considered to provide a context for understanding the potential effects of the Proposed Action and to provide a basis for assessing the significance of potential impacts. Several of these environmental components are regulated by federal and/or state environmental statutes, many of which set specific guidelines, regulations, and standards. These standards provide a benchmark that assists in determining the significance of environmental impacts under the NEPA evaluation process. The compliance status of each project area with respect to environmental requirements was included in the information collected on the affected environment. The areas of environmental consideration are air quality, biological resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources.

3.1 AIR QUALITY

Region of Influence - The region of influence (ROI) for air quality is RSA and the immediately surrounding area.

Affected Environment - The Air Quality Act of 1967, commonly referred to as the Clean Air Act (CAA), was designed to protect and enhance the quality of the nation's air resources. This Act, along with amendments adopted in 1970, 1977, and 1990, serves as the basis for air quality standards. National Ambient Air Quality Standards (NAAQS), established by the Environmental Protection Agency (EPA), and mandated by the CAA, are the standards for ambient concentrations of the criteria pollutants. These pollutants include sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), ozone (O₃), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM-10), and lead (Pb). The NAAQS concentrations are ceilings that may not be exceeded. The NAAQS and Alabama Air Quality Standards are shown in Table 3-1. Areas are classified in one of three categories:

- Attainment - better air quality than required by standards;
- Non-attainment - worse air quality than required by standards; and
- Attainment unclassified - insufficient data available for the area to warrant non-attainment status and justify attainment status.

The State of Alabama and the City of Huntsville have adopted the NAAQS. Redstone Arsenal is located in Madison County, which is in the Tennessee River Valley - Cumberland Mountains Air Quality Control Region. The Madison County area has an attainment unclassified designation for

all primary and secondary pollutant standards stipulated under the NAAQS. (U.S. Army Missile Command, 1994a)

Table 3-1: National and Alabama Ambient Air Quality Standards

Pollutant	Averaging Period ^a	Ambient Air Quality Standards (ug/m ³) ^b	Background Concentration (ug/ m ³)
Sulfur Dioxide	3 hours	---	---
	24 hours	365	86
	Annual	80	---
Total Suspended Particulates (PM-10)	24 hours	150	36
	Annual	50	---
Carbon Monoxide	1 hour	40	6.5
	8 hours	10	5.0
Ozone	1 hour	235	1.0
Nitrogen Dioxide	Annual	100	---
Lead	Calendar quarterly mean	1.5	---

^a - Arithmetic average except in the case of total suspended particular matter

^b - Expressed in micrograms per cubic meter

3.2 BIOLOGICAL RESOURCES

Region of Influence - The ROI for biological resources is Redstone Arsenal.

Affected Environment - This section describes the biological resources of RSA by major biotic habitat. Threatened and/or endangered species or species with unique habitats are also addressed. Information in this section comes from existing documentation and has not been completely field verified. Even though no exhaustive inventory of the flora and fauna of RSA have been done, the Nature Conservancy, through its Alabama Natural Heritage Program (ALNHP), has conducted a biological inventory of the Arsenal. This inventory was performed to determine the presence or potential presence of federally listed or rare species of plants and animals (ALNHP, 1995). A summary table of ecological resources is available in Appendices E through K of the October 1995 ALNHP document.

Terrestrial and aquatic resources on the Arsenal include vegetation and wildlife communities in a variety of ecological associations. Several federal agencies oversee various aspects of biological resource management. The Endangered Species Act (ESA) declares that it is the policy of Congress that all federal departments and agencies shall seek to conserve threatened and endangered species. Further, the ESA directs federal agencies to use their authorities in the furtherance of the purposes of the ESA.

Vegetative Communities - The Arsenal is a single tract of land encompassing approximately 38,000 acres and is diverse in both topography and vegetation. Elevations range from approximately 560 feet above mean sea level (msl) in bottomlands to 1,200 feet msl in the mountainous regions of the Installation. Forest lands, rights-of-way, test areas, old-fields (abandoned open areas) in various stages of plant succession, in addition to developed areas, creeks, sloughs, and ponds provide for abundant diversity in wildlife and fishery habitat types on the Installation. Approximately one-third of RSA lies within the 100-year flood plain of the

Tennessee River (U.S. Army Missile Command, 1994a). This habitat diversity provides for greater fish and wildlife species diversity. A comprehensive listing of the native vegetation within RSA boundaries is found in Appendix B of the *Natural Resources Management Plan for Redstone Arsenal*, July 1995.

Non-forest Lands - Hay and pasturelands encompass approximately 4,145 acres. The remaining acreage is comprised of semi-improved grounds (7,426 acres), old-field land, and wildlife openings.

Forest Lands - According to the 1988 Arsenal forest inventory, 16,180 acres (approximately 42 percent of the Arsenal) are covered in forest: approximately 4,226 acres as pines; 5,528 acres as hardwoods; 3,181 acres as mixed pine-hardwoods; and 3,245 acres as mixed cedar-hardwoods.

Pine stands located on the Installation are generally dominated by loblolly pine with some shortleaf pine. Most of the older pine stands are very dense with minimal ground cover with the exception of several stands that are extensively covered with kudzu. An estimated 2,000 acres of the open forested land is covered with kudzu that seriously threatens the natural vegetation and diversity of these areas.

Fish and Wildlife Communities - Some of the most common mammals on RSA and WNWR (approximately 4,000 acres of which are located on the Installation) are white-tailed deer, beaver, eastern cottontail rabbit, swamp rabbit, gray squirrel, fox squirrel, striped skunk, red bat, woodchuck, muskrat, opossum, raccoon, red and gray foxes, and coyote (U.S. Army Missile Command 1995; Weber 1996). A more comprehensive listing of mammals occurring on or in the vicinity of the Arsenal is given in Appendix F of the *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation*, December 1994.

Over 250 bird species are residents or migrants on RSA. As many as 100 species may be encountered year round. A comprehensive listing of birds occurring on or in the vicinity of RSA including WNWR is presented in Appendix F of the *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation*, December 1994.

There are well over one hundred species of fish found in Installation waters. Roughly half of these are considered to be abundant or common (U.S. Army Missile Command, 1995). A comprehensive listing of fish species collected at RSA and WNWR is located in Appendix F of the *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation*, December 1994.

Reptile and amphibian species are well represented on Arsenal and WNWR lands. Fifty-one species of reptiles and twenty-nine species of amphibians are known to be present in the vicinity. A comprehensive listing of the species is given in Appendix F of the *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation*, December 1994.

Wetlands - For an area to be classified as a Clean Water Act (Section 404 [b]) jurisdictional wetland, evidence of three parameters are required (U.S. Army Corps of Engineers 1987). These parameters are the presence of hydrophytic vegetation, hydric soils, and wetland hydrology.

Wetlands are among the most biologically productive natural ecosystems in the world; comparable to tropical rain forests and coral reefs in the number and diversity of species they support. Wetlands produce great volumes of food as leaves and stems break down in the water to

form detritus. This enriched material is the principal food for many aquatic invertebrates and forage fish that are food for larger commercial and recreational fish species.

Wetlands are critical to the survival of a wide variety of animals and plants, including numerous threatened and endangered species. For many species such as the wood duck, muskrat and swamp rose, wetlands are primary habitats. For others, wetlands provide important seasonal habitats where food, water, and cover are plentiful. In their natural condition, wetlands also provide flood protection, shoreline erosion control, natural products for human use, water quality improvement, and opportunities for recreation, education, and research.

A detailed jurisdictional wetland map for the Installation is not available. National Wetlands Inventory (NWI) maps for wetland types in Madison County have been prepared by the U.S. Fish and Wildlife Service. These non-jurisdictional maps were constructed from photo interpretations of aerial photography and were verified by spot ground-truthing. Recent work done by Geonex Corporation (1995) reports the total wetland acreage of the Arsenal to be 9,889.5 acres.

Wetlands on RSA are home to a large number and variety of plant and animal species. About 26 percent of the Installation is covered by wetlands. The wetlands are mostly associated with creeks or spring runs that are easily effected by the elevation of the Tennessee River (Weber 1996) and have bottomland hardwood forests associated with the Tennessee River and its major tributaries. About half of the Arsenal's wetlands are under WNWR jurisdiction. Redstone Arsenal's obligation is to oversee construction projects near any wetlands and to provide protection for both WNWR and Installation wetlands and mitigate any problems caused by construction in or near these areas.

Aquatic Resources - Redstone Arsenal is located on the north bank of the Tennessee River about 46 miles above Wheeler Dam and 17 miles downstream from the Guntersville Dam. Over 10,000 acres of the Arsenal are affected by high stages of the Tennessee River and other tributary streams. (U.S. Army Missile Command 1994a) Huntsville Spring Branch originates in springs and creeks of nearby mountain slopes, and flows southward through the urban areas of the City of Huntsville. The branch then enters a swampy area in the northeast corner of the Arsenal at mile 10 and flows southwestward to join Indian Creek, a tributary of the Tennessee River. Indian Creek, which joins the Tennessee River at mile 321, extends upstream through gently rolling topography with relatively little built-up area, containing pastureland, strip-cropping, and wooded areas. The normal pool of Wheeler Lake, at elevation 556, backs into the reservation to form two permanent pools of 680 and 575 acres, at the lower end of these streams. Within the Installation boundaries, Indian Creek drains approximately 12,000 acres and Huntsville Spring Branch drains approximately 11,000 acres. McDonald Creek runs along the eastern edge of the Arsenal and drains approximately 14 square miles of the northeastern corner of the Arsenal. The southern portion of the reservation drains into the Tennessee River through smaller channels. Approximately 2,000 acres, located south of Madkin Mountain, drains into outlets constructed in conjunction with Fowler Road.

Ponds located on the Arsenal are the result of gravel excavations, quarrying operations, or are of natural origin. Some ponds are in karst basins (limestone eroded by groundwater), and others are beaver ponds. Streams have been contaminated from various sources within the watershed. Huntsville Spring Branch and Indian Creek are the largest tributaries traversing the Installation. Both empty into the Tennessee River.

A range of aquatic habitat types are present on RSA from small ponds and quarry pits to the Tennessee River. Little documentation of the biological characteristics of these aquatic systems exists. A listing of fish species whose ranges include RSA and WNWR is given in Appendix F of the *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation*, December 1994. This appendix also contains a listing of aquatic invertebrate species collected in Huntsville Spring Branch and Indian Creek during long-term monitoring of these streams.

Threatened and Endangered Species - Biological resources warranting special protection include threatened and endangered species. Under the Endangered Species Act, federal agencies are prohibited from jeopardizing threatened or endangered species or adversely modifying habitats essential to their survival. Alabama ranks fourth in the nation (after Hawaii, California, and Florida) in the number of federally listed endangered and threatened plants and animals (U.S. Fish and Wildlife Service, 1998). Since much of the Arsenal has not been developed, the potential is high for finding rare species of plants and animals. The state of Alabama classifies federally listed threatened and/or endangered species found in the state collectively as “Alabama Protected” species (Guyse 1996).

Table 3-2 lists floral and faunal species whose accepted ranges overlap RSA and are considered threatened or endangered by either state or federal wildlife authorities.

Table 3-2: Federally Listed Endangered and Threatened, Alabama Protected, and Special Concern Species Occurring on Redstone Arsenal

SPECIES	STATUS
Gray Bat - <i>Myotis grisescens</i>	Federal - Endangered State - Protected
Bald eagle - <i>Haliaeetus leucocephalus</i>	Federal - Formerly Threatened State - Protected
Peregrine Falcon - <i>Falco peregrinus anatum</i>	Federal - Endangered State - Protected
Alabama cave shrimp - <i>Palaemonias alabamiae</i>	Federal - Endangered State - Protected
American alligator - <i>Alligator mississippiensis</i>	Federal - Threatened due to similarity of appearance
Tuscumbia Darter - <i>Etheostoma tuscumbia</i>	Federal Species of Concern State - Protected
Price's Potato-bean - <i>Apios priceana</i>	Federal - Threatened
American ginseng - <i>Panax quinquefolius</i>	Federal Candidate Category 3C State - Regulated by permit
Dwarf Trillium - <i>Trillium pusillum</i> var. <i>alabamicum</i>	Federal - Species of Concern
Harper's umbrella plant - <i>Eriogonum longifolium</i> var. <i>harperi</i>	Federal - Species of Concern
Southern cave fish - <i>Typhlichthys subterraneus</i>	State - Protected
Green salamander - <i>Aneides aeneus</i>	State - Protected
Eastern box turtle - <i>Terrapene carolina</i>	State - Protected

Source: Soos Weber, Directorate of Environmental Management and Planning, Redstone Arsenal, Alabama, 1999

3.3 CULTURAL RESOURCES

Region of Influence - The ROI for cultural resources is Redstone Arsenal.

Affected Environment - Cultural resources consist of prehistoric and historic districts, sites, structures, artifacts, and any other physical evidence of human activity considered important to a culture or community for scientific, traditional, religious, or other reasons. Cultural resources are generally divided into three categories: archaeological (prehistoric and historic), historic resources and structures, and traditional (e.g., American Indians, Hawaiian, or other ethnic groups).

The earliest recorded archaeological work, on what is now the Arsenal, was performed in 1915. More extensive and exacting regional excavations took place in the 1930s. Phase I archaeological testing is being conducted to identify sites potentially eligible for the National Register of Historic Places (NRHP). To date, approximately 44.4 percent of the Arsenal has been surveyed (DEMP, 1999). An inventory of historical buildings and structures, fully coordinated with SHPO, was conducted for RSA in 1984 (U.S. Army Missile Command, 1994a).

The Arsenal is divided into three topographic or landform zones that possess varying degrees of archaeological potential. Zone 1 is composed of rolling land combined with flat plateaus that have undergone considerable erosion and is considered to have low to moderate archaeological potential. Zone 2 is made up of the flood plains on the Arsenal and is considered to have high archaeological potential. Zone 3 is composed of mountainous land and is considered to have low archaeological potential. (U.S. Army Missile Command, 1994a)

There are 47 confirmed cemeteries located on the Arsenal. These cemeteries are inspected quarterly by government personnel to ensure they are clean and attractive, cleared of weeds and brush, that fences are maintained and closed, and that they are not being plowed or disturbed in any manner. Government contractors and agricultural lessees perform the annual maintenance. (U.S. Army Missile Command, 1995)

3.4 HAZARDOUS MATERIALS AND WASTE

Region of Influence - The ROI for hazardous materials and waste is Redstone Arsenal.

Affected Environment

Hazardous Materials - A variety of regulatory agencies define hazardous materials for specific situations. The broadest and most applicable is the Department of Transportation (DOT) definition for transportation of these materials. DOT defines a hazardous material as a substance or material that is capable of posing an unreasonable risk to health, safety, or property when transported in commerce (49 CFR 171.8).

Several federal agencies oversee various aspects of hazardous material usage. DOT regulates the packaging and transporting of hazardous materials, under 49 CFR parts 171 through 180 and Part 397. The Occupational Safety and Health Administration (OSHA) regulates the use of hazardous materials in the workplace in 29 CFR, primarily Part 1910. The EPA regulates environmental safety and public health issues associated with hazardous materials.

Hazardous Waste - Waste materials (defined in 40 CFR 261.2) include materials that are both solid and liquid (but contained). Hazardous waste is further defined in 40 CFR 261.3 as any solid waste not specifically excluded that meets specific concentrations or has certain toxicity, ignitability, corrosivity, or reactivity characteristics.

Hazardous waste oversight is provided primarily by EPA under the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and the Superfund Amendments and Reauthorization Act (SARA). EPA regulations are found in 40 CFR. DOT regulates transportation of hazardous waste under 49 CFR. AR 200-2 and RSA RCRA Part B Permit govern Redstone Arsenal's hazardous and toxic waste operations.

Pesticides - "Pesticides" is a general term, referring to any substance or mixture of substances that destroys pests, controls their activity, or prevents them from causing damage. Some pesticides either attract or repel pests while others regulate the growth of plants or animals. Pesticides are regulated as hazardous chemicals by OSHA and are required to be labeled in accordance with the Federal Seed Act and the labeling regulations issued under that Act by the Department of Agriculture. This label is required to list the registered site or location for use,

pests controlled, active ingredients, directions for use, precautions, protective equipment needs, and storage and disposal information.

Both government employees and contractors apply pesticides on RSA. Government employees require DoD certification while contractors require state certification. Contractors applying pesticides to the Arsenal are monitored by certified government employees. No aerial application of pesticides would occur, unless a serious disease or infestation required emergency treatment and prior approval was obtained by the Directorate of Environmental Management and Planning.

Both federal and state authorities regulate Army facilities that use, store or handle pesticides. Pesticide use, waste, and container disposal is regulated by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). OSHA *Safety and Health Standards* (29 CFR 1910), also play a part in the pest management process. *Pesticide Programs* (40 CFR Chapter 1, Subchapter E), contains regulations for the storage, disposal, overall management of pesticides and pesticide containers, and certification of persons who apply restricted use pesticides. DoD Directive 4150.7, *Pest Management Program*, sets forth the policy, responsibilities, and procedures for pest management programs. DoD Directive 4160.21-M, *Defense Utilization and Disposal Manual*, provides guidance for the handling, processing, and disposing of hazardous property in accordance with applicable environmental, safety, and other laws and regulations. AR 420-76, *Pest Management* (3 June 1986), provides policies, standards and procedures for pest control activities at Army controlled facilities. DA PAM 420-7, *Pesticide Use Training*, provides details on the proper use and handling of pesticides. AR 40-5, *Preventive Medicine*, details the requirements of the Army Preventive Medicine Program and provides guidance for pest and disease vector prevention and control. The Emergency Planning and Community Right-to-Know Act (EPCRA) requires communities to plan for chemical emergencies and gives citizens the right to know the location and nature of hazardous chemicals.

3.5 HEALTH AND SAFETY

Region of Influence - The ROI for health and safety is Redstone Arsenal.

Affected Environment - Health and safety includes consideration of any activities, occurrences, or operations that have the potential to affect one or more of the following.

- The well being, safety, or health of workers - Workers are considered to be persons directly involved with the operation producing the effect or who are physically present at the operational site.
- The well being, safety, or health of members of the public - Members of the public are considered to be persons not physically present at the location of the operation, including workers at nearby locations who are not involved in the operation and the off-installation population.

The standards applicable to the evaluation of health and safety effects differ for workers and the public; thus, it is useful to consider each separately.

OSHA is responsible for protecting worker health and safety in non-military workplaces. OSHA regulations are found in 29 CFR. For Army operations, AR 385-100, *Safety*, establishes the basis for worker safety programs.

Protection of public health and safety is an EPA responsibility (mandated through a variety of laws - e.g., RCRA, CERCLA/SARA, CWA and the CAA). EPA regulations are found in 40

CFR. Additional safety responsibilities are placed on DOT (for transportation issues [49 CFR]), DoD, and the Department of the Army (program requirements established in AMC 385-100).

The use of personal protective equipment (PPE) is essential for pesticide safety. There are three routes of entry of a pesticide into the body: oral exposure (mouth), dermal exposure (absorption through the skin and eyes), and respiratory exposure (inhalation through the lungs). The applicable label and Material Safety Data Sheet (MSDS) should be referenced for guidance in PPE selection.

Emergency Services - The Huntsville/Madison County area offers 911 emergency service to all of its residents. The fire and police departments of the cities of Huntsville and Madison are connected to this central service. Huntsville Emergency Medical Services, Inc., provides ambulance services for the Huntsville/Madison County area and is under subcontract to Redstone Arsenal. Fox Army Health Center, located on the Arsenal, provides medical treatment for military personnel both active and retired and to DoD civilian employees in the area. (U.S. Army Missile Command, 1994)

3.6 INFRASTRUCTURE AND TRANSPORTATION

Region of Influence - The ROI for infrastructure and transportation is Redstone Arsenal.

Affected Environment - Infrastructure includes facilities and systems providing power, water, wastewater treatment, and collection and disposal of solid waste. Transportation includes the modes of transportation (road, air, and rail) that provide circulation within and access to the Installation. Only surface road access will be discussed under transportation for this EA, since there are no predominant rail or marine facilities on the Installation and the airfield is not used as a transportation center.

3.7 LAND USE

Region of Influence - The ROI for land use is Redstone Arsenal.

Affected Environment - A *Real Property Master Plan, Land Use Analysis for Redstone Arsenal* was prepared for the Arsenal's Directorate of Environmental Management and Planning (DEMP) in April of 1999. This plan assists in planning for future growth and development, and promotes compatible and coordinated uses of land. The land on the Arsenal is divided into fourteen major use areas: family housing, troop housing, community facilities, recreation, administration, training facilities, operational facilities, operational maintenance facilities, production facilities, research and development facilities, test areas, storage, post maintenance and utilities, and the National Aeronautics and Space Administration (NASA) Marshall Space Flight Center. (DEMP, 1999)

Table 3-3 quantifies current land use on the Arsenal. Ownership of Arsenal land is as follows: Army (30,910 acres), the WNWR (4,085 acres), and the Tennessee Valley Authority (2,905 acres). (U.S. Army Missile Command, 1995)

Table 3-3. Current Redstone Arsenal Land Use

Land Use Category	Approximate Acreage	Percent of Total
Family Housing	463	1.2
Troop Housing	40	0.1

Community Facilities	270	0.7
Recreation	2,183	5.7
Administration	1,285	3.4
Training Facilities	6,727*	17.7
Operational Facilities	1,784	4.7
Operational Maintenance Facilities	644	1.7
Production Facilities	3,056	8.0
Research and Development Facilities	424	1.1
Test Areas	14,718	38.8
Storage	2,350	6.2
Post Maintenance and Utilities	293	0.8
Marshall Space Flight Center (NASA)	1,826	4.8
Roads, Rights-of-Way, and Undefined	1,905	5.0
Total	37,968*	100.0

Source: Redstone Arsenal Installation Land Use Plan

* Includes 58 acre plot outleased by RSA to U.S. Army and Naval Reserve Centers

The agricultural leasing and grazing program has been ongoing on the Arsenal since shortly after World War II. Currently, there are 5,413 acres of available agricultural land leased to private individuals under five year contracts for production of hay crops and pasture (cattle grazing). There are 4,843 acres used for cattle grazing and 570 acres for hay crops. Proper coordination between the military and the lessees has served to keep idle lands to a minimum. (U.S. Army Missile Command, 1995)

According to the 1988 Redstone Arsenal forest inventory, 16,180 acres (approximately 42 percent of the Arsenal) are covered in forest: approximately 4,226 acres as pines, 5,528 acres as hardwoods, 3,181 acres as mixed pine-hardwoods, and 3,245 acres as mixed cedar-hardwoods.

Elevations on RSA range from 556 to 1,239 feet. Approximately one-third of RSA lies within the 100-year flood plain of the Tennessee River. (U.S. Army Missile Command, 1994a)

3.8 NOISE

Region of Influence - The ROI for noise is Redstone Arsenal.

Affected Environment - The principal sources of noise on the Arsenal are rocket motor flight test and static firings, warhead detonations/impacts, gun firings, demolition, and airfield operations. Significant buffer zones exist between noise producing activities and the nearest population centers (U.S. Army Missile Command, 1994a).

The Installation Compatible Use Zone (ICUZ) Program identifies noise generating areas and magnitude of their environmental impact, and minimizes encroachment of noise sensitive activities both on and off the Arsenal (U.S. Army Missile Command, 1994a). Noise complaints are investigated and lessons learned applied to the Arsenal's test and training activities. Noise complaints, even inside the Arsenal boundary, have historically been minimal. (U.S. Army Missile Command, 1993)

3.9 GEOLOGY AND SOILS

Region of Influence - The ROI for geology and soils is Redstone Arsenal.

Affected Environment - The topography of RSA is gently rolling with elevations generally in the range of 600 to 650 feet MSL. The terrain generally slopes southward towards the Tennessee River. High areas on the Arsenal include Weeden and Madkin Mountains in the north-central portion of the Arsenal, with elevations up to approximately 1,200 feet above MSL. Bluffs such as Lehman's and Bell's along the Tennessee River are listed as outstanding natural areas (Alabama Natural Heritage Program, 1995). Low areas, comprised of valleys and floodplains along the Tennessee River and its tributaries to the north, are characterized by elevations of approximately 560 feet above MSL. (U.S. Army Missile Command, 1994a)

Geology - The geologic formations in Madison County are sedimentary in origin and were formed either by the accumulation of fragments of previously existing rocks, by the accumulation of organic matter, or by chemical precipitation. The principal sedimentary rock types found in Madison County are shale, sandstone, limestone, dolomite, and chert. (U.S. Army Missile Command, 1994a)

Most of Redstone Arsenal is underlain by the Tuscumbia Limestone. This limestone has an average thickness of 150 feet; consist of gray, medium to coarse-grained, fossiliferous limestone; and locally may contain chert nodules. The Fort Payne Chert, the Chattanooga Shale, and other, older geologic units successively underlie the Tuscumbia Limestone. The Fort Payne Chert is generally 155 to 185 feet thick and consists of alternating beds of bluish-gray chert and fine to coarse-grained, fossiliferous limestone. The Chattanooga Shale is approximately 10 feet thick and consists of dark gray to black shale. (U.S. Army Missile Command, 1994a)

Overlying the Tuscumbia Limestone, from oldest to youngest, are the Ste. Genevieve Limestone, Hartselle Sandstone, and Bangor Limestone, all Upper Mississippian in age. The Ste. Genevieve Limestone forms the slopes of the mountains and higher elevations above the Tuscumbia formation within the southern part of the Arsenal. This formation is composed of gray, thick-bedded oolitic limestone. The Hartselle Sandstone forms the top of Bradford Mountain and forms concentric bands around Madkin and Weeden Mountains. Tan, fine-grained, fossiliferous sandstone with some siltstone and shale make up the Hartselle formation. Bangor Limestone caps the Madkin and Weeden Mountains, which is comprised of gray, crystalline, oolitic, fossiliferous limestone. (U.S. Army Missile Command, 1994a)

The surface geology of Madison County consists of unconsolidated sedimentary material overlying the rock formations. The unconsolidated material, called "regolith," is mainly derived from the weathering of the bedrock. Regolith, derived from the Tuscumbia Formation, consists of moderate red to moderate reddish-orange clay and porous, powdery rectangular to irregular blocks of chert. Dense chert or rectangular blocks of fossiliferous chert are also present due to the weathering of the Fort Payne Chert immediately underlying the Tuscumbia Formation. Regolith thickness varies from 20 to 40 feet in the northeastern part of the Arsenal to as much as 80 feet in the southern and western parts. (U.S. Army Missile Command, 1994a)

Soils - According to the U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS) Soil Survey of Madison County, a total of 94 soil phases representing 39 different soil series are mapped within Arsenal grounds (Soil Conservation Service 1980). The predominant soil type mapped for the Arsenal consists of a deep, well-drained to moderately well-drained, silt loam to silty clay loam. These soils typically possess a loamy surface horizon underlain by a loamy to clayey subsoil layer with lenses of silty and/or sandy clay. Rock fragments generally occur throughout the clayey material. The soil colors range from a brownish-red in the northern

portion to a brownish-gray in the southern portion of the Arsenal. Darker gray soils are found in areas of topographic lows. Soil depths range from very shallow on the mountains to much deeper along the larger tributaries of the Tennessee River where broad floodplain areas have been formed by the river and its tributaries. No significant mineral deposits are known to exist on Redstone Arsenal, although several limestone quarries were worked on Madkin Mountain (U.S. Army Missile Command, 1994a).

Of the 94 soil phases mapped for the Arsenal, 52 of these phases representing two soil series are listed as potential prime farmland by the USDA, SCS (Soil Conservation Service, 1980). These prime farmland soils are located throughout a large portion of the level to gently sloping areas of the Arsenal, including uplands, foot slopes, stream terraces, and floodplains. Within areas of the Arsenal that are mapped as prime farmland, contiguous units of ten acres or more of urban or built-up land are excluded. Additionally, areas mapped as Egam silty clay loam or Ennis silt loams are also excluded as prime farmlands, where flooding during the growing season is more than once in two years. However, the SCS has determined that the prime farmland areas at the Installation are excluded from consideration as prime farmland per the Farmland Protection Policy Act. Federal and urban lands are excluded from consideration as prime farmlands per Farmland Protection Policy Act Public Law 97-98. This determination was made in accordance with guidelines provided in the National Agricultural Land Evaluation and Site Assessment Handbook, Section 601.04 (d), Lands to be Considered (U.S. Army Missile Command, 1994a).

3.10 SOCIOECONOMICS

Region of Influence - The ROI for socioeconomics is Redstone Arsenal and the Madison County area. Socioeconomics within this EA is concerned with population, employment, and recreation for the area as well as the economic impacts to the Arsenal from grazing, timber cutting, and associated agricultural lease activities.

Affected Environment - Although at one time a rural town, Huntsville has emerged as a center for military and space technology with the center of activity in the region located at RSA. This has occurred with the consolidation of Research and Development activities for Army rocket and missile projects at the Arsenal that continues to contribute to the region's economy. The Arsenal's presence has led to the convergence of a large number of defense contractors in the Madison County area. (U.S. Army Missile Command, 1994a)

Redstone Arsenal, as a major employer in Madison County, impacts the local economy through direct employment of civilian and military personnel as well as through the local procurement of goods and services. Direct employment by the Arsenal as well as employment directly generated from the Arsenal's procurement expenditures has led to an increase in the level of economic activity. (U.S. Army Missile Command, 1994a).

The State of Alabama, Madison County, and the local Huntsville area offer an extensive selection of recreational activities. Redstone Arsenal also offers an extensive recreational program with numerous facilities and a diversity of activities. There are various outdoors recreational activities offered that utilizes the Arsenal's lands. These include golf, fishing, swimming pools, and playing fields concentrated in the northern portion of the Arsenal convenient to family and troop housing areas. Two recreational areas are located along the Tennessee River. Facilities at these locations include playing fields, picnic areas, boat ramps, fishing piers, and a campground. Hunting, fishing, and trapping licenses are sold for these activities on the Arsenal. (U.S. Army Missile Command, 1994a)

There are direct benefits from the agricultural and grazing programs in place on the Arsenal. These benefits come in the form of cash rental paid to the government from the lessees. In 1994 the income generated through these leases was approximately \$41,900. There are additional services that provide indirect value to the government. The estimated value of these services is the total value of all work that the lessees do on the land for which the government does not have to pay. These services are in the form of mowing, seeding of eroded areas, clearing, seeding of pastures, maintenance of drainage ways, fertilization, weed control, and fence maintenance and construction. The estimated value of these services is approximately \$109,500 per annum on over 5,400 acres of agricultural leased land. (U.S. Army Missile Command, 1995)

3.11 WATER RESOURCES

Region of Influence - The ROI for water resources is Redstone Arsenal.

Affected Environment - Water resources include both surface water and groundwater. To protect these resources, and human health, Congress has enacted the Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA). The EPA has also established water quality standards to protect water resources.

Surface Water - The Tennessee River forms the southern boundary of the Arsenal. Major watercourses that flow through the Arsenal include Indian Creek, Huntsville Spring Branch, and McDonald Creek. Each of these tributaries flows generally south and then west toward the city of Triana to empty into the Tennessee River. (U.S. Army Missile Command, 1994a)

The majority of the western portion of the Arsenal is drained by Indian Creek, and the eastern half of the Arsenal is drained by Huntsville Spring Branch. Indian Creek originates north of the Arsenal in northwestern Madison County and flows southward across the Arsenal to Wheeler Reservoir. Indian Creek has been classified for fish and wildlife use by the Alabama Department of Environmental Management (ADEM). This wildlife and fish classification was based upon the presence of wastes, pH, temperature, dissolved oxygen, toxic or other deleterious substances (U.S. Army Missile Command 1994a). Huntsville Spring Branch originates from a spring in the city of Huntsville, flows southeasterly across the Arsenal and then empties into Wheeler Lake. Huntsville Spring Branch is also classified by the ADEM as a fish and wildlife use area.

Groundwater - The quality of the surface water varies across the drainage divide of the Arsenal. In the western half of the drainage area (including Indian Creek, western portions of the Tennessee River, and Wheeler Reservoir) the surface water is characterized as “moderately hard” to “hard,” moderately high in dissolved solids, locally high in manganese, and suitable for most uses after treatment. In the eastern portion of the drainage divide (including Huntsville Spring Branch, McDonald Creek, and the eastern portion of Wheeler Reservoir) the water is characterized as “hard” to “very hard,” locally acidic, low in dissolved oxygen, locally high in manganese, and high in biochemical oxygen demand. (U.S. Army Missile Command, 1994a)

The hydrogeology at the Arsenal can be characterized by three units: the regolith, the Tuscumbia/Fort Payne formation, and the Chattanooga shale. The Fort Payne chert and the Tuscumbia limestone comprise the limestone aquifer. This aquifer is characterized by abundant groundwater supplies suitable for potable and industrial uses. The upper regolith and the Chattanooga shale act as confining beds for the upper and lower boundaries of the limestone aquifer respectively. Due to this confining action of the regolith and Chattanooga shale, the

limestone aquifer is under artesian conditions in many areas. Groundwater movement reflects the surface topography and is generally flowing from the north to the south towards the Tennessee River. The potentiometric surface beneath the Arsenal ranges from 560 feet above msl to greater than 600 feet above msl. The aquifers beneath the Arsenal are some of the most productive in Madison County. None of the aquifers in Madison County have been designated as sole source aquifers per Section 1424(2)g of the Safe Drinking Water Act of 1974 (U.S. Army Missile Command, 1994a).

Groundwater from shallow wells drilled into the Tusculumbia limestone generally produce good quality water that is moderate in dissolved minerals. The average pH for groundwater in Madison County is 7.5. Due to past disposal and operations at the Arsenal several areas of contaminated groundwater currently exist at the Arsenal. Several different potential contaminants are present in the groundwater in varying concentrations. These include arsenic, trichloroethylene, benzene, and dichlorodiphenyltrichloroethane (DDT). The groundwater contamination does not appear to be migrating beyond the Arsenal boundaries (U.S. Army Missile Command, 1994a).

CHAPTER 4.0

ENVIRONMENTAL CONSEQUENCES

This section of the EA describes the potential environmental consequences of the Proposed Action. This is done by comparing proposed project activities with the potentially affected environmental components. Sections 4.1 through 4.11 evaluate the potential environmental consequences of the proposed activity. The amount of detail presented in each section is proportional to the potential for impacts. Sections 4.12 through 4.23 discuss the following with regard to proposed project actions: cumulative impacts; mitigation measures; individuals/organizations responsible for obtaining required permits/licenses/entitlements; conflicts with federal land use plans, policies, and controls; energy requirements and conservation potential; natural or depletable resource requirements and conservation potential; irreversible or irretrievable commitment of resources; biological diversity; adverse environmental effects that cannot be avoided; the relationship between the short-term uses of the human environment and the maintenance and enhancement of long-term productivity; federal actions to address environmental justice in minority populations and low-income populations; and conditions normally requiring an environmental impact statement.

To assess the potential for and significance of environmental impacts from the Proposed Action, a list of activities necessary to accomplish the Proposed Action was first developed (Sections 1.0 and 2.0). Then the environmental setting was described, with emphasis on special environmental sensitivities (Section 3.0). Next, the program activities were compared with the potentially affected environmental components to determine the environmental impacts of the Proposed Action.

Federal environmental laws and regulations were reviewed to assist in determining established thresholds for assessing environmental impacts (if any) in fulfillment of NEPA requirements. Proposed activities were evaluated to determine their potential to result in significant environmental consequences using an approach based on the interpretation of significance outlined in the CEQ regulations for implementing the procedural provisions of the NEPA (40 CFR 1500-1508) and AR 200-2, *Environmental Effects of Army Actions* (U.S. Department of the Army, 1988).

Guidelines established by the CEQ (40 CFR 1508.27) specify that significance be determined in relationship to both context and intensity (severity). The assessment of potential impacts and the determination of their significance are based on the requirements in 40 CFR 1508.27. Three levels of impact can be identified:

- No Impact - No impact is predicted.
- No Significant Impact - An impact is predicted, but the impact does not meet the intensity/context significance criteria for the specific resource.
- Significant Impact - An impact is predicted that meets the intensity/context significance criteria for the specific resource.

4.1 AIR QUALITY

The following sections describe the potential impacts to the environment from the Proposed Action and the No-Action Alternative, cumulative impacts, and potential mitigation measures pertaining to air quality.

4.1.1 Proposed Action

Procedures for the storage and application of pesticides, as established in the IPMP, would not significantly impact air quality at RSA. Therefore, there would be no significant impacts expected to air quality from the implementation of the IPMP. Although small amounts of particulate chemical product would enter the air during application procedures, these fugitive emissions would settle to the ground and would not exceed federal and state NAAQS concentration criteria. No pesticides are sprayed on RSA using aircraft (Nixon, 1995b), reducing the potential for impacts to air quality from the application of pesticides.

The *DoD Plan for the Certification of Pesticide Applicator* (September 1996), issued under the authority of DoD Instruction 4150.7, *DoD Pest Management Program*, replaces the *Department of Defense Plan for the Certification of Pesticide Applicators of Restricted Use Pesticides* (December 1985), and prescribes procedures for the DoD certification of pesticide applicators. The RSA IPMP would utilize two state certified pest controllers operating under contract, and one DoD certified pest controller, all of which would have successfully completed appropriate training requirements.

A certified government employee would supervise any contractor applying pesticides at RSA. With the proper, regulated application of chemical product, the potential for impacts to air quality resulting from improper application methods would be diminished. Environmental conditions such as wind speed, humidity, and temperature would have a minor affect on the acute impacts of pesticide application.

4.1.2 No-Action Alternative

If the No-Action alternative were chosen, the IPMP would not be implemented. There would be no impacts to air quality expected from the No-Action Alternative.

4.1.3 Cumulative Impacts

While the periodic application of pesticides on RSA would create short-term impacts to the immediate air-space surrounding the application area, cumulative impacts are not expected to air quality because of the relatively small amounts of chemical product that would be used in the application of pesticides. Also, since RSA will not use aerial application of pesticides, the chance of drift of pesticides to off-base communities is unlikely. People in surrounding communities will not be subjected to exposure to pesticides.

4.1.4 Mitigation Measures

In accordance with guidance established in the IPMP, pest controllers would follow restrictions and warnings on individual pesticide labels in compliance with FIFRA. This would ensure adherence with federal, state, and local requirements and would greatly diminish or eliminate impacts to air quality during the application of pesticides at RSA.

Factors in proper pesticide application include temperature, rain or irrigation, wind, and water resources. Volatility, a change from liquid to gas, increases as temperature increases. Liquid weed control products applied at ambient temperatures above 85 degrees F have a heightened chance of volatilization, which can injure nearby susceptible plants. These pesticides should be applied in the morning when air temperatures tend to be cooler.

Rain or irrigation activities occurring too soon after herbicide application removes the product from the weed and may in some cases greatly reduce its effectiveness. Pesticides should not be applied if rain is forecast within 24 hours. Wind can also cause the drift of pesticides to non-target sites. As a general rule, pesticides should not be sprayed when wind velocities exceed 10 miles-per-hour. Ideal application times exist when there is little wind (usually early morning) or when the wind blows gently away from non-target plants.

4.2 BIOLOGICAL RESOURCES

Criteria for determining the significance of potential impacts to biological resources are based on the relative importance of the resource, the quantity of the resource that would be impacted, the sensitivity of the resource to the proposed activities, and the duration of the impact. Impacts are considered significant if they are determined to have the potential to cause a reduction of the population size of federally listed or state protected threatened or endangered species, degradation of biologically important unique habitats, or substantial long-term loss of vegetation and the capacity of a habitat to support wildlife.

The following sections describe the potential impacts to biological resources from the Proposed Action and the No-Action Alternative, cumulative impacts, and potential mitigation measures pertaining to biological resources.

4.2.1 Proposed Action

The Proposed Action is to implement the IPMP, ensuring the appropriate management of pesticide storage and application procedures. Implementation of the IPMP would maintain and control existing biological resources such that potentially negative aspects of unchecked natural systems would be kept at an acceptable level. Although there would be the potential for impacts to non-target species, the impacts are not expected to be significant and there would be positive impacts to biological resources as a whole from implementing the IPMP.

Vegetative Communities

Control of weeds and other undesirable vegetation are one of the objectives of the IPMP. Weedy areas provide habitat for beneficial insects but may also attract rodents and arthropods such as rats, ticks, and fleas that might attack humans and domestic animals or carry diseases which will affect humans and domestic animals. Weeds can also serve as hosts for some fungal pathogens and insects that might attack desirable plants. Weeds can also grow large enough to cover signs,

block trails, or obstruct historic landscapes or vistas. Weeds that grow on buildings can cause structural damage if they grow into cracks in mortar or bricks.

Weeds along fence lines, on road shoulders, paved surfaces (including runways), etc., require pest control using appropriate herbicides. Control of unwanted plants is done mechanically (mowing, weed-eaters, etc.) as much as possible. All vegetation, including weeds and grasses, are considered target pests when occurring in concrete structures, hard stands, etc. Pesticides that would be used in the control of vegetation around obstacles to buildings are "Arsenal" (active ingredient, imazapyr, EPA Reg. No. 241-273), "Fade-Out" (active ingredient, glyphosate, EPA Reg. No. 524-370-402), and "Roundup" (active ingredient, glyphosate, EPA Reg. No. 524-445). These chemical products would be applied in the following concentrations of active ingredient: 27.6 percent, 18 percent and 41 percent, respectively. The pesticides would be applied to fence lines, concrete structures, and other obstacles located in regularly mowed areas. The method of dispersal for these pesticides is by backpack sprayer. Sensitive vegetative areas noted on the pesticide labels would be avoided.

Weeds that would require control on RSA, as specified in the IRMP, include those found on bunkers and in selected improved areas that are not frequently mowed. Improved areas are acreages on which intensive maintenance activities are planned and performed annually as fixed requirements. The pesticide used to treat weeds in these areas is Roundup at a concentration of 41 percent active ingredient. As with the pesticides that would be used to treat general nuisance vegetation, Roundup would be applied through the use of a backpack sprayer. Sensitive areas to be avoided are noted on the label and would be avoided. Bodies of water would also be avoided, in accordance with appropriate chemical product label restrictions.

A number of pesticides would be applied to vegetation on the golf course at RSA for the control of annual Bluegrass, turfgrass fungi, and Pythium blight. Target pests that damage the turf itself, including white grubs, Army worms, and cutworms would also be controlled. Any vegetation occurring within sandtraps would additionally be the target of pest control on the golf course. Worksheets describing these pests and others and details regarding procedures for the application of pesticides for control of these pests is found included as Appendix A of the IPMP.

Although the application of pesticides directly to the vegetation would have a negative impact on that vegetation, there would not be significant impacts to vegetative resources in general. The eradication of target pest would have a positive impact in those areas where the target pest encroach, namely on the golf course, where other species are desirable and would be able to flourish once the pests are removed.

Fish and Wildlife Communities

Crawling insects, such as ants, crickets, beetles, and spiders often require control in billets, family housing, food service facilities, warehouses, offices, and other administrative buildings. These pests constitute only a minor problem on RSA. Proper sanitation and housekeeping would discourage most of these pests and limit the required chemical control. Mice and other rodents occasionally invade buildings and would potentially require pest control efforts beyond what is available at Self Help.

Skunks are one of the animal pest most frequently encountered on RSA (IPMP, 1998). Special trapping efforts would potentially be required as a result of their nesting underneath buildings and

trailers. Predator and beaver control are also required at times on the Installation. These animals would be controlled by the wildlife biologist as directed in the approved Natural Resources Management Plan for Redstone Arsenal.

Aquatic Resources

Care must be exercised when use of pesticides is called for near bodies of water. No pesticides would be applied directly to wetlands or water areas, including lakes, rivers, and streams, unless use in these areas is specifically approved on the pesticide label and by the Pest Management Committee. Applicators should always consult and follow pesticide labels when applying pesticides on or near water.

Threatened and Endangered Species

The RSA Pest Management Coordinator and the DEMP Endangered Species Manager would evaluate ongoing pest control operations to ensure compliance with the Endangered Species Act. No pest management operations would be conducted that would be likely to have an impact on threatened or endangered species or their habitats without prior approval from the RSA Wildlife Biologist, DEMP, and the AMC Pest Management Consultant.

According to DEMP personnel, the agricultural lease for Area 101 will be terminated when it expires in December of 1999. This is the area in which the caves that are the habitat for the federally listed as endangered Alabama cave shrimp are located. This area will be reforested into upland hardwoods, and potential threats to the Alabama cave shrimp from pesticide usage in their habitat will be eliminated.

Although there would be the potential for impacts to threatened and endangered species from the transfer of chemical product through the natural food chain, implementing the IPMP would have indirect positive benefits to threatened and endangered floral and faunal species and their habitats on RSA. By eliminating or controlling certain species considered “pests”, other species that have smaller populations would be able to more easily thrive in the environment, as resources utilized by these species would be more readily available for consumption. The impacts to threatened or endangered species or their habitats are not expected to be significant with the implementation of the IPMP.

4.2.2 No-Action Alternative

If the No-Action alternative were chosen, the IPMP would not be implemented. There would be no concise, comprehensive operating procedures in place to manage RSA’s pest management activities. Adverse impacts would be expected in the absence of an IPMP. Without proper guidance from the IPMP, there is the potential that pesticides would either be applied in excess, or in amounts not sufficient for adequate pest control.

4.2.3 Cumulative Impacts

There would be positive cumulative impacts expected to biological resources and biodiversity from implementing the IPMP.

4.2.4 Mitigation Measures

Guidelines would be provided to Arsenal personnel and contractors involved in pesticide transportation, storage, and prior to application activities that could potentially impact biological resources. These precautionary measures include the avoidance of unique habitats and sensitive biological areas. Pesticide label instructions and cautionary statements are legal documents and should be strictly followed.

4.3 CULTURAL RESOURCES

Cultural and archaeological resources are limited, nonrenewable resources whose potential for scientific research or value may be easily diminished by actions that significantly impact the integrity of the property or through inaction to potential pest problems. The significance of impacts to cultural resources is determined by the intensity and context of the alteration to the distinctive characteristics and integrity of the resource.

The following sections describe the potential impacts to the environment from the Proposed Action and the No-Action Alternative, cumulative impacts, and potential mitigation measures pertaining to cultural resources.

4.3.1 Proposed Action

There would be potential positive impacts expected to cultural resources from implementing the IPMP. The Proposed Action would ensure guidance for operating and maintaining an effective pest management program. Establishing a pest management system of chemical and non-chemical control techniques would achieve effective pest control in or near cultural resources with minimal environmental contamination.

Buildings, ruins, and other artificial sites can be considered disturbed environments, which will become populated by pioneer plant species if there is no intervention. Weeds can become established anywhere that a suitable substrate and water are found. Gutters, cracks in roofs, walls or foundations, and chinks in masonry all can provide suitable locations for germination of weed seeds. Woody plants can take root in soil pockets or deep cracks and crevices.

4.3.2 No-Action Alternative

If the No-Action alternative were chosen, the IPMP would not be implemented. There would not be a planned program, incorporating continuous monitoring, education, record-keeping, and communication to prevent pests and disease vectors from causing unacceptable damage to operations, people, property, material, or the environment.

Areas within RSA which contain cultural resources would be subjected to potential significant impacts from some pests (e.g. encroachment of vegetation over existing cultural resources such as grave sites and termite damage to culturally significant structures).

4.3.3 Cumulative Impacts

There are no additional past, present, or reasonably foreseeable actions that would be expected to impact cultural resources in a cumulative manner; therefore, no cumulative impacts are expected.

4.3.4 Mitigation Measures

Regular monitoring for weeds is an essential part of an integrated pest management program for cultural resources. Weeds are most easily removed when they are small or present in low numbers. In the case of weeds that grow into structures or walkways, it is important to remove them before serious structural damage occurs. In addition to monitoring for population density, identification of the species is important. The biology of the weed will often determine when, during its life cycle it is to be removed, or the most appropriate herbicide, if chemical control is necessary.

Regular inspections around structures and in landscape beds should be performed to record weed species observed. Estimates of density, such as number per square foot or number along a transect should be recorded. If structural damage is already occurring, this should be noted as well. This type of information will help to correctly time pest control. It will also help to prioritize areas for pest control if resources are limited and to evaluate the success of pest control strategies used.

If, during IPMP activities on RSA, government personnel and contractors observe items that might have historical or archaeological value, such observations will be reported immediately to RSA personnel so that the Cultural Resources Manager may determine their significance and any special disposition of the finds. Activities in the area of the discovery that may result in the destruction of these resources would cease and personnel would be prevented from trespassing on, removing, or damaging such resources.

4.4 HAZARDOUS MATERIALS AND WASTE

The following sections describe the potential impacts to the environment from the Proposed Action and the No-Action Alternative, cumulative impacts, and potential mitigation measures pertaining to hazardous materials and waste.

4.4.1 Proposed Action

Hazardous materials (e.g., pesticides) would be used during activities described in the IPMP. No significant impact would be expected from the application of pesticides when label instructions are followed and the pesticide is used in accordance with a coherent management system.

There is only one pesticide mixing facility on the Arsenal, Building 107, located on the golf course. Pesticides in this facility are used by golf course personnel for golf course pest control and maintenance. With the exception of this facility, the current ground maintenance contract for the Arsenal requires that the storage, mixing, and disposal of pesticides used on the Arsenal be done off the Arsenal by the pest management contractor(s). This avoids problems such as spills and the dumping of excess pesticides. In addition, this also allows the pest management committee to avoid the use of acutely toxic materials.

Good application management practices result in most of the pesticide being used up during application. Excess pesticide wastes are handled as either solid waste (trash) or in some cases as a hazardous waste as required by FIFRA, RCRA, and state law. Most pesticide containers must be treated as hazardous waste. In some cases (excluding acutely toxic pesticides) proper decontamination (triple rinse) procedures for mostly empty pesticide containers allow them to be

disposed of as solid waste. Chemicals damaged in storage or old/out-of-date pesticides may require disposal as hazardous waste.

4.4.2 No-Action Alternative

If the No-action alternative were chosen, the IPMP would not be implemented. Subsequently, there would be no concise operating procedures in place for pesticide use. Potential, though not significant, impacts from the inconsistent application of pesticides would be expected. Without the IPMP, pesticides would still need to be periodically applied to control pest species. However, the pesticides that may be applied may not be the most environmentally acceptable or issues may arise from the improper disposal of containers.

4.4.3 Cumulative Impacts

There are no additional past, present, or reasonably foreseeable actions that would be expected to impact hazardous materials and waste in a cumulative manner; therefore, no cumulative impacts are expected.

4.4.4 Mitigation Measures

Under the IPMP, proper pesticide application and good management practices would be used and monitored. All personnel involved in pesticide application would be trained and certified. Certified personnel would be re-certified every three years.

Adequate precautions would be taken during pesticide application to protect the public, on and off the Installation. Pesticides would be applied in the morning hours when the air is more likely to be cooler and at a time when there is little or no wind. Pesticides would not be applied when rain is forecast to occur within 24 hours of scheduled application. Only the amount of pesticides intended for use would be mixed to minimize pesticide waste. Excess pesticides would be disposed of as hazardous waste. Unless properly handled, most pesticide containers must be treated as hazardous waste products. In some cases (excluding acutely toxic pesticides) proper decontamination (triple rinse) procedures for mostly empty pesticide containers can change them from hazardous waste products to solid waste products that can be disposed of in an approved sanitary landfill.

4.5 HEALTH AND SAFETY

The following sections describe the potential impacts to the environment from the Proposed Action and the No-Action Alternative, cumulative impacts, and potential mitigation measures pertaining to health and safety.

4.5.1 Proposed Action

There would be positive impacts to health and safety expected from implementation of the IPMP. The Proposed Action is to implement the IPMP in a timely, consistent, and effective manner to ensure the wise use, management, and protection of resources within RSA. Establishing a coherent pest management system would enhance existing health and safety conditions and limit the storage of excess pesticides.

No aerial application of pesticides would occur under the proposed plan, unless a serious disease or infestation required emergency treatment and prior approval was obtained from AMCOM for aerial pesticide application.

There would be positive impacts expected to fire safety on RSA through the implementation of the IPMP. Prescribed burning and maintenance of firebreaks and grazing lands reduces fire danger. Firebreaks impede the progress of fires and are used as trails to transport fire-fighting equipment to otherwise inaccessible areas.

4.5.2 No-Action Alternative

If the No-Action alternative were chosen, the IPMP would not be implemented. There would be potential significant impacts to health and safety since there would be insufficient management attention to pesticide applications. In addition, firebreaks would not be properly maintained, thus increasing the threat of the progress of a fire in the event of wildfires in inaccessible areas.

4.5.3 Cumulative Impacts

There are no additional past, present, or reasonably foreseeable actions that would be expected to impact health and safety in a cumulative manner; therefore, no cumulative impacts are expected.

4.5.4 Mitigation Measures

Under the IPMP, PPE would be used for safe pesticide application. Hearing protection would be used as required. Storage of excess pesticides would be minimized due to limited shelf life. No pesticides would be applied on or near sensitive terrestrial or aquatic environments unless specifically approved by the Pest Management Committee. The IPMP would also help ensure that certified pest controllers perform pest control operations in the following categories.

- Ornamental and turf pest control (EPA category 3)
- Aquatic pest control (EPA category 5)
- Right-of-way pest control (EPA category 6)
- Household pest control

No aerial application of pesticides would occur under the proposed plan, unless a serious disease or infestation required emergency treatment and prior approval were obtained from AMCOM.

4.6 INFRASTRUCTURE AND TRANSPORTATION

The following sections describe the potential impacts to the environment from the Proposed Action and the No-Action Alternative, cumulative impacts, and potential mitigation measures pertaining to infrastructure and transportation.

4.6.1 Proposed Action

There would be positive impacts expected to infrastructure and transportation from implementing the IPMP. The Proposed Action is to implement the IPMP to ensure the wise protection, use, and management of RSA resources. Significant adverse impacts to infrastructure would be avoided by establishing a coherent management system to prevent the overgrowth of vegetation along utility rights-of-way and firebreaks on RSA.

4.6.2 No-Action Alternative

If the No-Action alternative were chosen, the IPMP would not be implemented. This alternative would cause potential adverse impacts to infrastructure and transportation by reducing maintenance of utility rights-of-way and fire breaks and thus increasing the risk of service disruptions and restricting access and fire control in times of fires, natural disasters or other incidents.

4.6.3 Cumulative Impacts

There would be positive cumulative impacts expected to infrastructure and transportation from implementing the IPMP. The overall time and cost to respond to fires and natural disasters, utility system disruptions, and other incidents would be reduced. Also, the associated mission disruptions and restoration costs would be minimized.

4.6.4 Mitigation Measures

Under the IPMP, the overgrowth of vegetation along utility rights-of-way, firebreaks, and Installation roads would be managed to reduce potentially adverse impacts from interruption and restricted access to utility systems and roadways. Firebreaks would be maintained for access by emergency vehicles.

4.7 LAND USE

The following sections describe the potential impacts to the environment from the Proposed Action and the No-Action Alternative, cumulative impacts, and potential mitigation measures pertaining to land use.

4.7.1 Proposed Action

There would be positive impacts expected to land use from implementing the IPMP. Use of the IPMP would result in effective, economical and environmentally acceptable pest control and would be instrumental in maintaining compliance with pertinent laws and regulations.

Major land use areas (family housing, troop housing, community facilities, recreation, administration, training facilities, operational facilities, operational maintenance facilities, production facilities, research and development facilities, test areas, storage, post maintenance and utilities, and George C. Marshall Space Flight Center) would be programmatically maintained in concert with Redstone Arsenal's natural resources. Land uses on the Arsenal would continue in a planned manner.

4.7.2 No-Action Alternative

If the No-Action alternative were chosen, the IPMP would not be implemented. There would be no guidance for the judicious use of chemical and non-chemical pesticide control techniques. The goal of achieving effective pest control (with minimal impact on human health, the environment, aesthetics, and ecological balance of the Installation) would not be realized.

4.7.3 Cumulative Impacts

There would be positive cumulative impacts expected to land use from implementing the IPMP. Pests on the Installation would be controlled with minimal impact on human health, the environment, aesthetics, and ecological balance. By their nature, pesticides do not foster biodiversity; however, their judicious application can enhance the quality of life.

4.7.4 Mitigation Measures

No mitigation measures are necessary for land use, although sensitive areas would be avoided.

4.8 NOISE

The following sections describe the potential impacts to the environment from the Proposed Action and the No-Action Alternative, cumulative impacts, and potential mitigation measures pertaining to noise.

4.8.1 Proposed Action

There would be no impacts to noise expected from implementing the IPMP. Normal noise producing activities on RSA would continue but would not be affected by the IPMP, nor would the IPMP cause any excessive noise during its implementation.

The principal sources of noise on RSA are rocket motor flight tests and static firings, warhead detonations/impacts, gun firings, demolition activities, and airfield operations. The primary sources of noise associated with implementing the IPMP would be from equipment used in applying pesticides. While wildlife may temporarily move away from noise producing activities, they would be expected to return when the activities cease. Any personnel operating equipment that would create a noise hazard would follow all appropriate health and safety guidelines.

4.8.2 No-Action Alternative

If the No-Action alternative were chosen, the IPMP would not be implemented. There would be no impacts to noise expected, as there would be no change to the general types of activities in the area.

4.8.3 Cumulative Impacts

There are no additional past, present, or reasonably foreseeable actions that would be expected to impact noise in a cumulative manner; therefore, no cumulative impacts are expected.

4.8.4 Mitigation Measures

Any personnel operating equipment that would create a noise hazard would follow all appropriate OSHA, Army, and RSA health and safety guidelines.

4.9 GEOLOGY AND SOILS

The following sections describe the potential impacts to the environment from the Proposed Action and the No-Action Alternative, cumulative impacts, and potential mitigation measures pertaining to geology and soils.

4.9.1 Proposed Action

The IPMP provides guidance for operating and maintaining an effective pest management program and stresses the principles of integrated pest management. Integrated pest management consists of the judicious use of both chemical and non-chemical control techniques to achieve effective pest control with minimal environmental contamination. These principles would minimize the impacts to geology and soils; therefore, no significant impact is expected.

Once applied to the ground surface, a number of things may happen to a pesticide. It may be taken up by plants or ingested by animals, insects, worms, or microorganisms in the soil. It may move downward in the soil column and either adhere to particles or dissolve. The pesticide may vaporize and enter the atmosphere, or break down via microbial and chemical pathways into other, less toxic compounds. Pesticides may be leached out of the root zone by rain or irrigation water, or wash off the land surface. The fate of a pesticide applied to soil depends largely on its properties of persistence, adsorption, and solubility, all of which are extremely variable with soil and pesticide types.

There is one pesticide mixing and storage site on RSA. It is located at the Golf Course, in Building 107.

4.9.2 No-Action Alternative

If the No-Action alternative were chosen, the IPMP would not be implemented and potential significant adverse impacts could occur. There would be no operating procedures in place to ensure the appropriate application of pesticides (to include herbicides). A lack of adequate guidelines for pest management could lead to the over-application of pesticides, resulting in increased soil erosion. Increased soil erosion could result in increased turbidity of surface waters and the subsequent siltation of waterways.

4.9.3 Cumulative Impacts

There are no additional past, present, or reasonably foreseeable actions that would be expected to impact geology or soils. Older, banned pesticides like DDT, aldrin, and dieldrin could persist for years in the environment. In soils, approved pesticides degrade to low-toxicity substances in days or weeks. Since they degrade so quickly, repeated applications will not create an increasing toxic substance reservoir in the soil.

4.9.4 Mitigation Measures

Mitigation measures for geology and soils include spill cleanup and notification procedures. The IPMP includes pollution abatement procedures. An adequate pesticide spill cleanup kit would be maintained in the golf course pesticide storage area, Building 107, and in the expanded Self Help

Store Building 3500, where only household quantities are stored. An adequate spill cleanup kit would also be kept on pest control vehicles. Spill cleanup and notification procedures are provided in the Spill Prevention Control and Countermeasures (SPCC) Plan and Installation Spill Contingency Plan (ISCP) for Oil and Hazardous Substances.

4.10 SOCIOECONOMICS

The following sections describe the potential impacts to the environment from the Proposed Action and the No-Action Alternative, cumulative impacts, and potential mitigation measures pertaining to socioeconomics.

4.10.1 Proposed Action

The Proposed Action is to implement the IPMP in a timely, consistent, and effective manner and ensure the proper application, storage, and transportation of pesticides. There would be no significant impacts expected to socioeconomics from the implementation of the IPMP. No additional personnel are anticipated to be required for the implementation of the plan and there would be no impacts to population or employment in the region.

4.10.2 No-Action Alternative

If the No-Action alternative were chosen, the IPMP would not be implemented. There would be no concise operating procedures in place to ensure the appropriate application of pesticides. There would be no impacts to population or employment in the region under the No-Action Alternative.

4.10.3 Cumulative Impacts

There are no additional past, present, or reasonably foreseeable actions that would be expected to impact socioeconomics in a cumulative manner, therefore, no cumulative impacts are expected.

4.10.4 Mitigation Measures

No mitigation measures are anticipated for socioeconomics.

4.11 WATER RESOURCES

The following sections describe the potential impacts to the environment from the Proposed Action and the No-Action Alternative, cumulative impacts, and potential mitigation measures pertaining to water resources.

4.11.1 Proposed Action

There would be positive impacts to water resources from implementing the IPMP. The Proposed Action is to implement the IPMP in a timely, consistent, and effective manner and ensure the proper management and application of pesticides and herbicides. By establishing a coherent management system, negative impacts to water resources would be avoided. The IPMP addresses the proper use and disposal of pesticides that could adversely affect water resources with indiscriminate use. By properly managing the storage, application, and disposal of pesticides, potential impacts to streams that cross the Arsenal would be avoided.

4.11.2 No-Action Alternative

If the No-Action alternative were chosen, the IPMP would not be implemented. There would be no concise operating procedures in place to manage the storage, application, and transportation of pesticides and herbicides on the Arsenal. This could cause significant adverse impacts from a lack of oversight on pesticide application that could impair local water quality. Improper use and disposal of pesticides could potentially contaminate surface and groundwater.

4.11.3 Cumulative Impacts

There would be positive cumulative impacts to water resources expected from implementing the IPMP. The IPMP, when followed, would reduce the chance of a serious accident that could damage ecosystems and the environment. The IPMP provides guidelines to DoD personnel and contractors prior to activities that could potentially impact water resources. This action would avoid unnecessary contamination and protect valuable natural resources. Implementing the IPMP would ensure long-term, positive cumulative impacts to water quality by promoting proper pesticide management and by assuring minimal pesticide contamination from surface water runoff.

Unlike the older banned pesticides DDT, aldrin, and heptachlor, approved pesticides degrade in surface water and ground water in days or weeks. Properly applied, these approved pesticides will not accumulate in ground or surface water. Therefore, application of approved pesticides as specified on label directions and in the IPMP, would not have a direct cumulative impact on water resources. Indirectly, the IPMP will have a positive cumulative impact by limiting accidents that could impact water resources.

4.11.4 Mitigation Measures

Guidelines would be provided to Arsenal personnel and contractors involved in pesticide transportation, storage, and application activities that could potentially impact water resources. These precautionary measures would avoid contamination problems and would help to protect water resources on the Arsenal.

4.12 CUMULATIVE IMPACTS

The IPMP, by providing concise guidelines for safe use of pesticides, would ultimately limit the chance of accidents that could seriously damage ecosystems and the environment. Aside from this positive impact, long-term cumulative impacts would not be expected with approved pesticides because of their short lifetime in the environment. Old pesticides, now banned, including DDT, dieldrin, and heptachlor had lifetimes of years in groundwater and surface water. However, approved pesticides degrade to low-toxicity or non-toxic substances in days or weeks. Hence, unlike the DDT-era, currently available pesticides do not accumulate and persist in water and soil. Properly used, pesticides can kill pest species and then degrade to low toxicity substances. Long-term cumulative impacts from pesticide use would not be expected.

RSA will not use aerial application. Drift to surrounding communities would not be anticipated, and the local population will not be subjected to pesticide exposure from applications at RSA.

4.13 MITIGATION MEASURES

Mitigation measures for the Proposed Action are not required for cultural resources, noise or socioeconomics. Mitigation measures for the remaining resources are summarized below.

AIR QUALITY - The periodic mixing and application of pesticides on the Arsenal would emit small amounts of particulate chemical product into the air. Mitigation measures for air quality would include the use of PPE for pest management personnel, and the strict adherence to all chemical product label instructions, warnings, and restrictions.

BIOLOGICAL RESOURCES - To reduce the amount of chemical product entering the biological system, methods of IPM are strongly recommended. IPM utilizes several pest management tools to manipulate the components of an ecosystem for the balanced, healthy coexistence of those resources. IPM techniques minimize the harm to the environment, reduce the long-term need for chemical pesticides, reduce the potential of pesticide resistance, and minimize pesticide waste.

HAZARDOUS MATERIALS AND WASTE - Proper pesticide application and good management practices would be used and monitored. If it is necessary to dispose of excess pesticides or pesticide containers, they would be disposed of as hazardous waste, if required, and in accordance with federal, state, DoD and Army regulations. Strict adherence to chemical product labels, warnings, and restrictions are critical to minimizing impacts to hazardous materials and waste.

HEALTH AND SAFETY - Personal Protective Equipment (PPE) would be used for safe pesticide application. Pesticide application would be done by DoD certified government employees or by State certified contractors. No aerial application of pesticides would occur under the proposed plan, unless a serious disease or infestation required emergency treatment and prior approval were obtained by DEMP. Because of the limited shelf life of some pesticides, storage of excess pesticides will be minimized.

INFRASTRUCTURE AND TRANSPORTATION - The overgrowth of vegetation along utility rights-of-way, firebreaks and installation roads would be managed to reduce potentially significant adverse impacts from interruption and restricted access to utility systems and roadways. Firebreaks would be maintained for access by emergency vehicles.

GEOLOGY AND SOILS - Soil erosion and siltation of waterways would be minimized by following the grounds maintenance and soil erosion control measures and guidelines in the Land Management and Grounds Maintenance Plan and the Soil Erosion Control Plan.

WATER RESOURCES - The IPMP addresses the proper use and disposal of pesticides that could adversely affect water resources from contaminated runoff entering streams and aquifers. Through the strict adherence to pesticide product restrictions, potential adverse impacts to water resources would be minimized and therefore limit potential future mitigation measures.

4.14 INDIVIDUALS/AGENCIES RESPONSIBLE FOR OBTAINING REQUIRED PERMITS/LICENSES/ENTITLEMENTS

The Army Materiel Command Pest Management Consultant will approve the Pest Management Plan, and will give special attention to any pesticide application that uses restricted use pesticides, uses any pesticide that may significantly contaminate surface or ground water, includes 259 or more hectares (640 acres) in one pesticide application, may adversely affect endangered or other protected species or habitats, or involve aerial application of pesticides (IPMP, 1998).

4.15 CONFLICTS WITH FEDERAL, STATE, OR LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

The proposed IPMP for Redstone Arsenal does not present any conflicts with federal, regional, state, or local land use plans, policies, or controls.

4.16 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

Anticipated energy requirements of IPMP activities can be accommodated within the current energy supply for RSA. Energy requirements would be subject to any established energy conservation practices.

4.17 NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL

Other than the use of vehicle fuels for the pesticide application vehicles, no significant use of natural or depletable resources is required by the action.

4.18 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

Although the Proposed Action would result in some irreversible and irretrievable commitment of resources such as fuel and labor, this commitment is not significantly different from that necessary for normal activities taking place on the Arsenal.

4.19 BIOLOGICAL DIVERSITY

Biological diversity (biodiversity), or the variety of life and its processes, is a basic property of nature that provides enormous ecological, economic, and aesthetic benefits. The loss of biodiversity is recognized as a major national as well as global concern with potentially profound ecological and economic consequences. Conservation of biodiversity is a national goal provided for in the framework of NEPA. This goal is to anticipate and evaluate the effects of federal actions on biodiversity and actively manage for the reduction of the impact of these effects as well as the promotion of restoration to previously impacted areas. The basic goal of biodiversity conservation is to maintain naturally occurring ecosystems, communities, and native species. For the Proposed Action evaluated in this EA, there would be positive impacts expected to biodiversity in the ROI. Through the coherent management of pesticide storage, mixing, and application, target pests would be controlled, while protecting threatened or endangered species and their habitats. Threatened and Endangered species are discussed under the Biological Resources Section in Chapters Three and Four.

4.20 ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

There are no adverse environmental effects from the Proposed Action that cannot be avoided or minimized. Adherence to the IPMP would protect the various resources located on RSA to the maximum extent possible while reducing pest populations on RSA to acceptable levels.

4.21 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The productivity and future land use of RSA would not be adversely impacted by implementation of the Proposed Action. No options for future use of the environment would be eliminated.

4.22 FEDERAL ACTIONS TO ADDRESS ENVIRONMENTAL JUSTICE IN MINORITY POPULATIONS AND LOW-INCOME POPULATIONS

The Proposed Action would be undertaken in a manner that would not substantially affect human health or the environment. The Proposed Action would not exclude persons from participation in, deny persons the benefits of, or subject persons to discrimination under, the program actions because of their race, color, or national origin. Also, there would be no disproportionate effects to minority communities or socioeconomic.

4.23 CONDITIONS NORMALLY REQUIRING AN ENVIRONMENTAL IMPACT STATEMENT

Potential impacts from the Natural Resources Management Plan for Redstone Arsenal were evaluated in the context of the criteria for actions requiring an Environmental Impact Statement described in DoD Directive 6050.1, *Environmental Effects in the United States of Department of Defense Actions* (U.S. Department of Defense 1979), and AR 200-2, *Environmental Effects of Army Actions* (U.S. Department of the Army 1988). Specifically, the proposed project activities were evaluated for their potential to:

- significantly affect environmental quality or public health and safety;
- significantly affect historic or archaeological resources, public parks and recreation areas, wildlife refuge or wilderness areas, wild and scenic rivers, or aquifers;
- adversely affect properties listed or meeting the criteria for listing on the National Register or the National Registry of Natural Landmarks; significantly affect prime and unique farmlands, wetlands, ecologically or culturally important areas, or other areas of unique or critical environmental concern;
- result in significant and uncertain environmental effects or unique or unknown environmental risks;
- significantly affect a species or habitat listed or proposed for listing on the federal list of endangered or threatened species;
- establish a precedent for future actions;
- adversely interact with other actions resulting in cumulative environmental effects;
- involve the use, transportation, storage, and disposal of hazardous or toxic materials that may have significant environmental impact.

The evaluation indicated that the Installation Pest Management Plan for Redstone Arsenal, as described in this EA, did not meet any of these criteria.

CHAPTER 5.0

CONCLUSIONS AND RECOMMENDATIONS

The impact to the environment by the IPMP for Redstone Arsenal has been assessed. A more detailed comparison of the environmental consequences of each alternative is found in Section 2.3.

Alternative 1 (Proposed Action) would most effectively manage and preserve Redstone Arsenal's pest management activities as required by federal, state, local, DoD, and Army regulations. With the Proposed Action, Redstone Arsenal would implement the IPMP in a timely, consistent, and effective manner. The IPMP describes the Installation's pest management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety, and environmental requirements of the program. The plan would serve as a guide for maintaining a safe and healthy environment to control pests that could interfere with the military mission, damage real property, increase maintenance costs, and expose Installation personnel to disease.

While the IPMP does include several important aspects of IPM, more could be done to develop the Installation plan into a more integrated approach as described in Section 1.1.2. It is recommended that when contracts for pest management control are renegotiated, language is included in the contracts to ensure that recognized principles of Integrated Pest Management are included.

The Proposed Action would have potentially positive impacts to biological resources, health and safety, infrastructure and transportation, land use, geology and soils, and water resources. Positive cumulative impacts would be expected for the environment in the areas of biological resources, infrastructure and transportation, land use, and water resources. There would be no anticipated significant adverse impacts to the other environmental resources considered. Any identified impacts to the environment are not considered to be significant and would be mitigable.

If the No-Action Alternative were selected, the IPMP would not be implemented. There would be no comprehensive pest management for RSA. The Arsenal would experience decreased grounds maintenance, increased fire hazard, inconsistent pesticide management, a possible loss of suitable and varied floral and faunal habitats including threatened and endangered species habitats, and decreased availability of outdoor recreation activities. Under the No-Action Alternative, potential adverse impacts would be expected to biological resources, health and safety, infrastructure and transportation, land use, geology and soils, and water resources.

CHAPTER 6.0

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CHAPTER 7.0

INDIVIDUALS/AGENCIES CONSULTED

7.1 Agencies/Organizations/Individuals Sent Copies of the Assessment

As part of the CEQ Regulations on the National Environmental Policy Act, the U.S. Army Aviation and Missile Command is circulating the Environmental Assessment of the Installation Pest Management Plan for Redstone Arsenal to the following agencies, organizations, and individuals.

Alabama State Historic Preservation Office, Montgomery, Alabama

U.S. Army Aviation and Missile Command, Directorate of Environmental Management and Planning, Natural Resources Team (AMSAM-RA-EMP-IR-NR), Redstone Arsenal, Alabama

U.S. Environmental Protection Agency, Atlanta, Georgia

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CHAPTER 8.0

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CHAPTER 9.0

ACRONYMS AND ABBREVIATIONS

ADEM	Alabama Department of Environmental Management
ALNHP	Alabama Natural Heritage Program
AMC	Army Material Command
AMCOM	U.S. Army Aviation and Missile Command
AR	Army Regulation
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CWA	Clean Water Act
dB	decibels
DEMP	Directorate of Environmental Management and Planning
DDT	dichlorodiphenyltrichloroethane
DoD	Department of Defense
DOT	Department of Transportation
EA	Environmental Assessment
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
ESA	Endangered Species Act
F	Fahrenheit
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FNSI	Finding of No Significant Impact
FY	fiscal year
ICUZ	Installation Compatible Use Zone
IMP	Integrated Pest Management
IPMP	Installation Pest Management Plan
ISCP	Installation Spill Contingency Plan
MSDS	Material Safety Data Sheet
msl	mean sea level
MVA	megavolts absolute
NASA	National Aeronautics and Space Administration
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO ₂	nitrogen dioxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O ₃	ozone
OSHA	Occupational Safety and Health Administration
Pb	lead
pH	acidity/alkalinity scale
PM-10	particulate matter with an aerodynamic diameter less than or equal to 10 microns
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act

R&D	Research and Development
ROI	Region of Influence
RSA	Redstone Arsenal
SARA	Superfund Amendments and Reauthorization Act
SCS	Soil Conservation Service (now known as the NRCS, the Natural Resources Conservation Service)
SHPO	State Historic Preservation Office
SO ₂	sulfur dioxide
SPCC	Spill Prevention Control and Countermeasures
U.S.	United States
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WNWR	Wheeler National Wildlife Refuge